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THE WASHINGTON MEETING.

The Twelfth Annual Meeting of the American Gas Light Association having been duly held at the appointed time, as veracious chroniclers we are called upon to review the proceedings of the Washington gathering; and the task becomes all the more gratifying when we are enabled at the outset of our history to confidently assert that the 1884 meeting goes upon the record as about the best arranged and best managed session of the entire twelve; and this statement need not be taken as in any sense belittling the arrangement and management of its predecessors, for the experience gained in the past has simply been put to its proper use. In the first place, President Stedman kept the delegates strictly to their work, and those conversant with the controlling of public assemblages know how much depends upon the tact of a presiding officer, and what a nice matter it is for such an officer to keep the proceedings thoroughly in hand. Mr. Stedman filled the bill completely; his rulings were accurate and impartial, and the business of each day was pleasantly and satisfactorily accomplished; Secretary Humphreys, bright, energetic and active, as is his usual wont, rendered the Chairman most efficient aid; the various committees reported promptly, and not a single blemish marred the executive working,

Everything appeared to chime in with the exertions of the Committee of Arrangements, for the morning of October 15th opened bright and clear—a most perfect specimen of that mystical season known to fame as an "Indian Summer day"—just sharp enough in its early period to send the blood tingling through one's veins with an exhilarating buoyancy, and gradually melting into a genial warmth with the progress of "old Sol's" march overhead, until the hazy sunset time was reached. Just that sort of atmospheric condition prevailed throughout the entire three days, enhancing the pleasure of those who had journeyed from afar, and adding to the comfort and satisfaction of the nearby visitant. When the Speaker's gavel came down upon the table, promptly at the hour of ten o'clock on the morning of the first day, a goodly throng was in attendance, and many of the older members could not help reverting back to the Third Semi-Annual Meeting of the Association, which was also held in Washington, on date of May 12th, 1875. The body then was slowly struggling into life, but it had within it the germ that was to grow and spread into a vigorously flourishing vitality; still, who expected then the results that have now been achieved? Aggressive and strong in its intelligence, the child of 1875 has become the giant of 1884, all thanks to those who carefully and patiently presided over its training.

When the first portion of the regular routine business was disposed of, the preliminaries consisting of the election of new members (the applications numbering 16), the report of Committee of Arrangements, who submitted a programme for the regular order of business and entertainment for the sessions, and the calling of the roll, which disclosed the presence of 142 members, President Wm. A. Stedman read the inaugural address. The really admirable and thoroughly practical manner in which he handled the various themes treated of in his message riveted the attention of his hearers, and earned for him a most attentive and appreciative audience. He dismissed the electric lighting phase of artificial illumination by noting that the system appeared to have outlived its value in the field of speculation, and that its promoters had now become students of the rather prosaic work of how to earn dividends; and we might go further than this by characterizing their latest avocation as also closely allied to the "art heroic." It was not to be supposed that Mr. Stedman, who has always been one of the most thorough-

going and studious experimenters in the line of improved methods for firing benches since the subject was first brought prominently before the attention of gas engineers, would fail to make some mention of the radical and startling theories lately promulgated in England by an eminent member of the fraternity. Of course the weight of all recent testimony in regard to the subject at issue is in favor of Mr. Stedman's side of the question, and is likely to remain so, despite the positiveness of Mr. Valon's belief in the soundness of his premises. Nor was it likely that the Chairman would fail to mention a question of vastly greater import to the gas men of this country—the question of legislation shaping itself in the direction of securing the capital invested in gas plants from the attacks of marauders and plunderers. The speaker mentioned the likelihood of favorable action being taken on the proposition to establish a gas commission in the State of Massachusetts; but while we agree with him in awarding Mr. Greenough all possible credit for the stand taken, we are very much afraid that the Massachusetts law makers will need much prodding before they can be made to understand the true nature of the situation, or be induced to frame such enactments as will give security and safety alike to gas consumer and gas purveyor. However, it is nevertheless true that some one must take the initiative, and we are in entire accord with the Chairman when he says, "The news is a decided move in the right direction." In connection with this we are sorry to note that the special committee, appointed at the meeting of 1882, to take into consideration the best means of making available the suggestions contained in the annual address of President Hickenlooper—the same committee, in 1883, having been continued and instructed to take similar action in regard to the annual message of President Forstall—failed to reach any exact plan for carrying into practical effect the matters discussed in these addresses. The committee, which consisted of Messrs. Vanderpool, Turner, Slater, and Wood, report they are fully alive to the importance of the topics considered, and state that they have given much time and thought thereto, the result of the examination being to convince them that such an organization as the one proposed cannot be immediately effected. We had hoped that they might find it possible to reach a different conclusion, and that they would come prepared with some plan which would be the means of settling many a vexed question in relation to gas polity. However, this special committee has now been discharged, and we appear to be further off from a solution of the riddle than ever. President Stedman's address will be found on pp. 228-9 of this issue, and its perusal cannot fail to be made with other than profit by the reader.

Secretary and Treasurer Humphreys' report ought to make the members comfortable as to the condition of their financial status, and the schedule of membership should show them how strong is their individual standing. But two deaths are recorded on the mortuary roll for year 1883—those of Mr. M. H. Jones, of Easton, Pa., and Mr. W. G. Cartwright, of Hoboken, N. J.

The persistent and not to be denied urging of Secretary Humphreys had the effect of bringing before the Association ten papers from eight different authors, on subjects full of interest. The following is the list: "Valves *vs.* Centerseals for Working Purifiers," by Mr. S. G. Stiness; "The Relation of Capital to the Output," by Mr. Thos. D. Gilbert; "Periodical Testing of Consumers' Meters," by Mr. C. H. Nettleton; "Natural Gas," by Mr. C. E. Hequembourg; "Gas Stoves a Means of Revenue," by Mr. R. B. Taber; "Iron Sponge for Purifying," by Mr. H. F. Coggshall; "A Positive Cure for Choked Standpipes," by Mr. S. G. Stiness; "Registry of Meters," by Mr. E. McMillin; "Coating Gas Mains with Coal Gas Tar," by Mr. G. A. Hyde; and "Notes on Chemistry of Gas Making," by Mr. E. McMillin.

The reading of these papers, and the subsequent discussions, furnished plenty of profitable mental occupation on the 15th and 16th. We note a stray waif from England, in which it was stated that many of the meetings of the English gas associations were somewhat lacking of late in the freedom and spirit of their discussions. But if that is sometimes the case over there, the like charge could not apply here; and the question-and-answer style followed in our American organizations is certainly an excellent system of "getting at the bottom facts."

The election of officers for the ensuing year resulted in the selection of Mr. Eugene Vanderpool, of Newark, N. J., as President; Messrs. A. C. Wood, Thomas Butterworth, and Malcolm S. Greenough as Vice-Presidents; and Mr. C. J. R. Humphreys was very properly chosen as his own successor to the offices of Secretary and Treasurer. The inducements held out by Gen. Andrew Hickenlooper were such as to influence the committee selected to name the next place of meeting to unanimously agree upon Cincinnati, Ohio, as the correct location. Within the limits of this article it would simply be impossible to give but the briefest mention of the business transacted, or to describe the general and striking interest maintained throughout. Our "official report" will convey the details to our readers, and full of good things we bespeak it to be.

Having thus disposed of "the feast of reason" in rather curt and summary fashion, how are we to do even seeming justice to the "flow of soul" that ensued after the business portion of the proceedings had been brought to a close? How can we ever place, so that it may read other than stilted and formal, upon the record a proper recognition of the charming and open-handed hospitality ordered by the Washington Gas Light Company, and dispensed with such genial heartiness by that prince of gas men—whole-souled, big-hearted, ever patient George A. McIlhenny. His influence seemed to pervade everywhere and over everything; and right well did Secretary Humphreys "hit it up" when, in his official notice of September 2d, after speaking of the attractiveness of the National Capital as a place for holding the sessions of the Association, he said, "When to these inducements the pleasure of again meeting with one who was among the earliest promoters of the Association is added, enough is said, it is thought, to make every member strive to the utmost to be present at the Convention." And so he was one of the promoters of the Association, both in deed and name. Still, the business in hand compels us to pass from a consideration of the pleasant memories of old to a recital of the things that are, but ever keeping in remembrance the deeds of days gone by.

Washington is always a place full of interest to the visitor, as it contains within its precincts the evidences of our country's freedom and strength; but when the temporary sojourner therein rejoices in the guidance of such hosts as George A. McIlhenny and the Washington Gas Light Company, why then indeed is the pathway strewn with roses. Of course, as all good citizens should do, an invitation to visit the President at the White House was most eagerly accepted; and after lunch on the afternoon of the second day the members, accompanied by the delegation of the weaker sex who had made the trip to Washington, were personally introduced to President Arthur, who, it is needless to add, was as urbane and courteous as ever. A delightful hour was passed in inspecting the different apartments in the executive mansion, and then back to the hotel to business.

On the evening of Thursday, October 16th, the banquet was held in the large dining-room of Willard's famous hostelry. The main table was arranged in one long line with cross tables at each end, the disposition of the festive board being somewhat after the shape of a letter H, with the horizontal member thereof liberally extended. The cross tables were adorned with elegant pillows of natural flowers, and baskets and bouquets were placed at frequent and appropriate intervals. The *menu* was everything that could be desired—in fact it could not have been surpassed. At the head of affairs was seated Col. Stedman, flanked on either side by the Hon. Judge Edmonds, General Webb, Commissioner West, Prof. Mason, Col. Snowden, Commissioner Dyrenforth, along with Messrs. McIlhenny, Vanderpool, Thomas, Bartol, Greenough, White, Wood, Humphreys, Butterworth, and others. Covers had been laid for 165 guests, and, as it may be imagined, Willard's "saw a sight." When the edibles had been disposed of Captain W. H. White, who was called to the position of toast-master (any one who knows "Cap" need not to be told he is a perfect master of the art), gave out the regular order, and all of the responses thereto were remarkably apt and happy.

On Friday morning, after a short business session, the members repaired to the west side of the Treasury Building, where a photographic picture en groupe was taken. The next move was to get aboard the carriages in readiness for the visit of inspection to the Washington Gas Light Company's works. It need not be said that everyone was highly delighted with the visit, or that a careful scrutiny of everything was made. The Washington plant thoroughly deserves its reputation for completeness and compactness. Coaches then conveyed the party to the wharf at which was moored the steamer Mary Washington in readiness to carry them to that spot so sacred to the hearts of the American people—Mount Vernon. Some of the visitors then trod its hallowed precincts for the first time, and many were the memories which the visit evoked. Still, and with sorrow we say it, some things concerning the management of this hallowed place are shameful in the extreme. As an instance of the truth of this we will mention the fact that the tomb in which the remains of Washington and his wife repose was undergoing repairs; the plaster had been stripped from the walls and ceilings, but instead of being immediately removed, it was allowed to lie upon the floors, and even upon the sarcophagi of the illustrious dead. It may have been but mere neglect, but certainly never was neglect less excusable.

The company re-embarked for the Capital at 3:30 P.M., a notable and affecting incident of the return trip being the calling to order of an impromptu meeting on the steamer's upper deck. The excursionists arranged themselves in as compact order as possible, and the spokesman called upon the party to sing, in honor of our old-time, trusted, and staunch friend, George A. McIlhenny, the strains of "Auld Lang Syne." To say the response was heartfelt and willing but feebly expresses the thrilling manner of its rendition, its earnestness and effect being shown to best advantage by the sudden dimming of many a veteran's vision. Pleasant conversation and recounting of reminiscences brought the voyage to a termination, and shortly after sunset saw the visitors back at the hotel. In every respect did the Twelfth Annual Meeting carry out the objects for which the Association was founded, and both pleasant and profitable are the remembrances of its sessions to those who were in attendance at them.

[Official Report.]

Twelfth Annual Meeting of the American Gas Light Association.

Held at Willard's Hall, Washington, D. C., Oct. 15, 16, and 17.

First Day, Morning Session—Wednesday, Oct. 15.

The Twelfth Annual Meeting of the American Gas Light Association was called to order by President William A. Stedman, of Newport, R. I., at ten o'clock, A.M., on the 15th day of October last. The sessions were held in Willard's Hall, a place of Assembly enclosed within the walls of Willard's Hotel, which hostelry had previously been chosen as headquarters. The arrangements were in all respects admirable. When President Stedman announced that everything was in order for the regular transaction of business, Mr. F. C. Sherman moved that the reading of the minutes of the Eleventh Annual Meeting (held at Teutonia Hall, New York city, October, 1883) be dispensed with, as the same had been published in the American Gas Light Journal. The motion was agreed to.

APPLICATIONS FOR MEMBERSHIP.

Applications for membership, in due form, were received from the gentlemen whose names are given below.

On motion of Mr. S. G. Stiness, the Secretary was directed to cast the ballot of the Association in favor of the election of all the applicants for membership. The President appointed Messrs. M. S. Greenough and D. D. Flemming as tellers to receive and report upon the ballot. Secretary Humphreys cast the ballot as directed, the tellers reported the result, and the Chairman having declared that the applicants were unanimously elected to membership, formally introduced the following named gentlemen to the Association:

NEW MEMBERS.

Wm. C. Adams, Richmond, Va.	A. E. Boardman, Macon, Ga.
Chas. A. Blodgett, Brooklyn, N. Y.	J. S. Connelly, Pittsburg, Pa.
Walton Clark, New Orleans, La.	Wm. J. Fay, Denver, Col.
C. D. Flanigen, Athens, Ga.	Thos. J. Hayward, Baltimore, Md.
C. E. Hoover, Winchester, Va.	Wm. M. Lane, Lancaster, Pa.
J. B. Loomis, Lynn, Mass.	Hayward G. Leavitt, New York, N.Y.
Fred Mayer, Baltimore, Md.	W. J. O'Brien, New York, N. Y.
Wm. Simpkin, Richmond, Va.	S. S. Townsend, New York, N. Y.

REPORT OF COMMITTEE ON ARRANGEMENTS.

Mr. William Helme, from Committee of Arrangements, reported that the Committee had arranged the following programme for the sessions of the Association, and also stated that, acting on behalf of the members, the Committee had accepted, with thanks, the invitation of the Washington Gas Light Company for the entertainments indicated on the annexed order card:

PROGRAMME.

Wednesday, October 15.—10 o'clock, A.M.—Meeting called to order by the President; reading of Record; Election of new members; Address by the President; Report of Executive Committee; Treasurer's Report; Report of Finance Committee; Reports of Special Committees; Election of Officers; General Business. 12:30 to 2 o'clock, P.M.—Recess; collection of dues at Secretary's office after morning session. 2 o'clock, P.M.—Reassembling; reading of papers and discussions; roll call. 6 o'clock, P.M.—Adjourn.

Thursday, October 16.—9 to 10 o'clock, A.M.—Tickets for banquet and excursion, to be obtained at Secretary's office. 10 o'clock, A.M.—Meeting called to order; reading of papers and discussions. 12:30 to 2 o'clock, P.M.—Recess. 2 o'clock, P.M.—Reassembling; reading of papers. 6 o'clock, P.M.—Adjourn. 8 o'clock, P.M.—Banquet.

Friday, October 17.—9 o'clock, A.M.—Meeting called to order. 9:10 o'clock, A.M.—Omnibuses will be at hotel for accommodation of members wishing to visit the Gas Works. 11 o'clock, A.M.—Leave Gas Works for Seventh street wharf. 11:30 o'clock, A.M.—Take special steamer Mary Washington, at Seventh street wharf, for Mount Vernon. 3:30 o'clock, P.M.—Steamer leaves Mount Vernon, arriving in Washington 5:30.

Mr. S. G. Stiness—It seems to me that it would be nothing more than courteous for the Association to formally accept the invitation of the Washington Gas Light Company, and also to formally tender them our thanks for their kindly remembrance of our Association upon the occasion of our meeting in the city of Washington. I therefore move that we accept the tender of the hospitality of the Washington Gas Light Company, and extend to them our hearty thanks for their kindly recognition of our presence in their city.

Mr. M. N. Diall—I take great pleasure in seconding that motion.

The President—Such a motion is eminently proper, and I know that it meets the hearty concurrence of every member. I take very great pleasure in putting the motion of Mr. Stiness.

The motion was unanimously adopted.

ROLL CALL.

Upon the call of the roll the following members were found to be in attendance:

Active Members.

Allmand, Charles S., Norfolk, Va.	Anderson, J., Cincinnati, Ohio.
Andrew, John, Chelsea, Mass.	Atwood, Henry A., Plymouth, Mass.
Balmore, John, New York, N. Y.	Burtis, P. T., Chicago, Ill.
Bates, John W., Hoboken, N. J.	Baumgardner, J. H., Lancaster, Pa.
Battin, Isaac, Albany, N. Y.	Baxter, Robert, Halifax, Nova Scotia.
Baxter, Wm. H., Petersburg, Va.	Baxter, Isaac C., Evansville, Ind.
Beal, Wm. R., New York, N. Y.	Booth, Chas. E., New York, N. Y.
Breese, E. M., Detroit, Mich.	Bush, Jno. S., New York, N. Y.
Butterworth, Thomas, Rockford, Ill.	Bauer, P., Washington, D. C.
Cabot, George D., Lawrence, Mass.	Crafts, David W., Northampton, Mass.
Cadwell, Wm. D., Nashua, N. H.	Curley, Thomas, Wilmington, Del.
Cartwright, J., Fishkill-on-H'sn, N.Y.	Cabot, Jno., Lawrence, Mass.
Cartwright, Matt, Rochester, N. Y.	Collins, A. P., New Britain, Conn.
Cartwright, William, Oswego, N. Y.	Coyle, Patrick, Charlestown, Mass.
Coggshall, H. F., Fitchburg, Mass.	Corbett, Chas. H., Brooklyn, N. Y.
Cornell, Thomas C., Yonkers, N. Y.	Cressler, A. D., Fort Wayne, Ind.
Cowing, John H., Buffalo, N. Y.	Connelly, T. E., Pittsburgh, Pa.
Davis, F. J., Boston, Mass.	Dickey, R. R., Dayton, Ohio.
Denniston, W. H., Pittsburg, Pa.	Down, W. H., New York, N. Y.
Diall, M. N., Terre Haute, Ind.	Dingee, F. A., Philadelphia, Pa.
Edgerton, H. H., New Orleans, La.	
Floyd, Jos. R., New York, N. Y.	Flemming, D. D., Jersey City, N. J.
Fodell, W. P., Philadelphia, Pa.	Floyd Fred. W., New York, N. Y.
Fowler, John, Philadelphia, Pa.	Findley, Jno. H., Ogdensburgh, N.Y.
Gardner, William, Pittsburgh, Pa.	Griffin, John J., Philadelphia, Pa.
Gates, Frederick W., Hamilton, Ont.	Geggie, David H., Quebec, Can.
Gilbert, T. D., Grand Rapids, Mich.	Gerould, Chas. L., Manchester, N. H.
Goodwin, W. W., Philadelphia, Pa.	Gardner, Jas. R., Pittsburgh, Pa.
Greenough, Malcolm S., Boston, Mass.	Gribbell, Jno., New York, N. Y.
Guerard, A. G., Savannah, Ga.	
Hanford, L. C., Norwalk, Conn.	Humphreys, C. J. R., Bergen P't, N. J.
Harbison, John P., Hartford, Conn.	Hequembourg, C. E., Bradford, Pa.
Helme, William, Philadelphia, Pa.	Hyde, G. A., Cleveland, Ohio.
Hookey, Geo. S., Augusta, Ga.	Hallet, J. L., Springfield, Mass.
Humphreys, Alexander C., New York.	
Isbell, Charles W., New York, N. Y.	Jones, S. Lewis, Philadelphia, Pa.
Knowles, J. H., Richmond, Va.	Kuehn, J. L., York, Pa.
Kraft, Geo. W., Philadelphia, Pa.	
Lindsley, Edward, Cleveland, Ohio.	Lynn, J. T., Chattanooga, Tenn.
Littlehales, T., Hamilton, Ont.	Langford, John S., Newtown, Mass.
Ludlam, Edwin, Brooklyn, N. Y.	Lowe, Leon P., Philadelphia, Pa.
Leach, H. B., Taunton, Mass.	
McCauley, L. G., West Chester, Pa.	Morris, H. G., Philadelphia, Pa.
McElroy. John H., Pittsburgh, Pa.	McDonald, William, Albany, N. Y.
McIlhenny, G. A., Washington, D.C.	McCullough, E. H., Philadelphia, Pa.
McIlhenny, John, Philadelphia, Pa.	McDougal, John, Hornellsville, N.Y.
McMillin, Emerson, Columbus, Ohio.	Merrick, Samuel V., Philadelphia, Pa.
Monks, Richard J., Boston, Mass.	
Neal, George B., Charlestown, Mass.	Norton, A. M., Nashua, N. H.
Nettleton, Chas. H., Derby, Conn.	
Pearson, W. H., Toronto, Ontario.	Parrish, W., Seneca Falls, N. Y.
Prichitt, Samuel, Nashville, Tenn.	Perkins, James D., New York, N. Y.
Pratt, J. C., Jamaica Plain, Mass.	Prichard, Chas. F., Lynn, Mass.
Page, George S., New York, N. Y.	
Rogers, Jas. F., Jamaica Plain, Mass.	Richardson, F. S., N. Adams, Mass.
Rowland, T. F., Greenpoint, N. Y.	
Sherman, F. C., New Haven, Conn.	Stiness, Samuel G., Pawtucket, R. I.
Slater, A. B., Providence, R. I.	Smedberg, Jas. R., Lancaster, Pa.
Smith, C. F., Havana, Cuba.	Stein, E., Philadelphia, Pa.
Smith, Marcus, Wilkesbarre, Pa.	Sprague, Chas. H., Boston, Mass.
Stanley, I. N., Brooklyn, N. Y.	Smallwood, James B., Baltimore, Md.
Starr, James M., Richmond, Ind.	Sheldon, H. H., Providence, R. I.
Stedman, William A., Newport, R.I.	Smith, R. A. C., New York, N. Y.
Turner, Thomas, Charleston, S. C.	Thomas, Jos. R., New York, N. Y.
Tufts, Nathaniel, Boston, Mass.	Vanderpool, Eugene, Newark, N. J.
White, Wm. Henry, New York, N. Y.	Whitney, Step. W., Albany, Y. N.
Williams, James, Johnstown, Pa.	Weber, O. B., New York, N. Y.
Wood, Austin C., Syracuse, N. Y.	

PRESIDENT'S ADDRESS.

President Stedman then read the following address:

Gentlemen of the American Association:—The returning autumn brings us again into this harvest field of ripe experience to garner into memory's storehouse the rich yield of practical knowledge and demonstrated truth, with which our promised papers are doubtless replete; and to glean the grains of fruitful suggestion which are scattered through our discussions. The earnest harvesters are here, intent on acquisition, and ready to do their part to make ample returns for the good they receive. Let us hope that all present are very much in earnest, and that promptness in assembling at the appointed hour, and eagerness to listen to all the proceedings, even should they at times seem a little prosy, will be marked features of this meeting. And let a spirit of polite consideration for the speakers and for those who would be listeners, do away with the exasperating buzz and hum of conversation, which at meetings heretofore have invidiously distinguished the back seats. We must all do our part to make and maintain order. None would voluntarily be guilty of a discourteous act, particularly toward a member of the Association. And so it is only thoughtlessness that allows one to lapse into the eminently impolite and embarrassing side talk, which unconsciously swelling in volume, as in earnestness, rises to a positive interruption. Quiet and attentive hearers are as much a necessity to the success of the meeting as interesting speakers; and let me remind you that each and all are to contribute to the success of the meeting whether you take the *role* of essayist or add to the general enlightenment by taking part in the discussions, or if you are simply the pleased and interested auditor whose beaming face inspires the speaker. They also serve who sit and keep quiet.

In looking over the field of practical work no startling discovery illuminates any particular point; but in every direction there seems to have been hearty effort and continuous and intelligent progress. The business of electric lighting has about outlived its value as a speculation, and it appears now to be settling down to the more prosaic work of earning, or trying to earn, dividends. It has been shorn of the blandishments by which the guileless investor was taken in; and it is no longer invested with the terrifying features which robbed the gas shareholder of his slumbers. Of late the attention of inventors is turned toward the development of electricity as a motor. Confidence in the permanence of gas for illumination is restored, and we no longer have to regard the possibility that our chief product may be relegated to the simple purposes of heating and cooking. However much these latter applications are desirable in connection with our present business, it was not cheering to feel that we might be crowded down and out from the more esthetic application.

Every step we take in the direction of cheapening the cost of gas is a step further from danger of rivalry. A retrospect of ten years will give encouragement. Take your manufacturing books and see, first, how many cubic feet you have gained from the carbonization of a ton of coal; next, how much the fuel account has been reduced; then see how, by judicious arrangement and management, the life of retorts and settings has been prolonged, and the production of gas from each retort has been increased, not only for the per diem account, but in the aggregate of total production; consider how manual labor has been reduced by the devices in substitution for bone and muscle; finally, take the cost of gas in the holder, as compared with the cost ten years ago, making due allowance for difference in prices of materials, and I am sure you will have cause to look forward hopefully, because we are not yet at the end of the avenue of progress. What has been done will be far surpassed by what is already in the germ ready for the practical intelligence which shall quicken it into perfect development.

Attention all over the gas making world has been engaged during the past year in perfecting the application of regenerative firing to furnace work. Our English friends have apparently made up their minds on this subject, and are hastening its introduction into their retort-houses. In this country the subject is receiving much attention, and many styles of construction have been employed. This rational and scientific method of heating our retorts makes an exceedingly fruitful subject for discussion, and doubtless will receive a due share of your attention.

No one has yet secured an additional foot of gas per pound of coal over the standard of last year, as far as I have heard. It is in order now to advance in the matter of yield per pound, as no decided gain has taken place within the last few years. It is within recent memories that 4.25 was the orthodox result, and suspicion attached to statements of any considerable increase over these figures. We overcame the difficulties in the upward path to five feet; but about here we seem to have paused, for beyond is the domain of stopped stand-pipes, pitchy mains, naphthaline, gas so attenuated as to require much strengthening, and altogether so much trouble and uncertainty as to render a slight gain of doubtful value. No step we could take would do more to cheapen the production of gas than to materially increase the yield. Who steps forward to lead us around all these obstacles and point the safe road beyond? We are promised a specific for stopped stand-pipes. We have already at our own service an hydraulic main which can be thoroughly cleaned without stopping the make. We want only more refractory retorts and fire materials, and a guarantee against naphthaline, to warrant us in attempting the achievement of another foot. There is a good deal more possible gas in the coal than we get out of it, and we do not despair of approaching nearer to thorough work than we stand to-day.

Regenerative firing is making a revolution in the building of retort-houses. About all the new constructions have the furnace floor at the ground level. This arrangement gives plenty of ventilation, ample space for working the furnaces, and the collateral advantages in taking care of the coke and reducing its handling are evident. The sole apparent drawback is the cost of elevating the coal to the charging floor; but this cost is so small as not to weigh against the manifest advantages. With the firing of the furnace, done simultaneously with the drawing of the charge, and the rest of the coke dropped below, the work of stokers is reduced, and the helpers on the charging-floor almost dispensed with. Below the coke is quenched and loaded into wagons at once when the sales are brisk; or, if the coke is to be crushed and prepared for market, suitable devices for handling it are provided. A large number of furnaces are taken care of by one man; so that the make of gas per man, including all about the retort-house should be very large. With a good sale of residuals, the cost of gas in the holder will be a figure that will confirm the confident statement that coal gas is the light of the future.

When we have entirely outgrown the traditions which enthralled us previous to our society formations, we shall give each other the benefits of our figures in a way to make comparisons of results something more definite than close guesses. The gas sold per ton during a year; the bushels of coke sold; the gallons of tar and ammoniacal liquor; and what were the receipts from each. Or, leaving out the money value, it is evident we could hardly compare results to such advantage in any other way. Sometimes we obtain for a period of favoring conditions extraordinary results, and we naturally speak of them rather than about the accompanying drawbacks. We do this, perhaps, more from the unconscious desire not to burden our auditor with a tale of trouble than to impress him with our success. But we ought really to tell the whole story, however it may pain him to hear it, because it may save him from disaster, and he may know the remedy we need to obviate our drawbacks. The bottom lines of a year's work, wherein disadvantages and advantages have offset each other, and wherein our hopes and expectations are balanced against the materialism of federal money, are instructive to contemplate. We are told that materials cost so much and labor so much, and hence cost of gas in the holder is so much. It is not worth while to gainsay the statement; but we know how many items are to be added in, and how, despite our endeavors, these will intrude to swell the cost of production and delivery. Any process which would evade them would be a great success. But mere statement of cost of materials and labor, however seductive to the investing public, or even to the average director, fails to convince the gas engineer. Bring the manufacturing accounts of the different processes side by side, compare item with item, and let the verdict rest on the *whole* truth. We are called conservative and incredulous; but the whole story, practically proved, will bring conviction where partial statement, with much reservation, will fail.

We ought to be able to ascertain the exact truth about the different processes at this meeting. We have representatives here who could give us the minutest figures of daily work. The yield per ton of gas, coke, tar, etc., under good working conditions, is perfectly well known. The receipts from residuals, or rather the quantities of residuals, left for sale are not so well agreed upon. But we need to have clear and explicit statements of the best obtainable results from several different processes, so that we can take home to our desks to figure on the statistics impartially given by those whose position enables them to state from experience the advantages and disadvantages of some of the "improvements in the manufacture of gas," of which we hear so much, and about which we can learn so little. Make the facts which each has acquired the common property of all.

Some one says that the clock, the scales and the two-foot rule are the emblems of civilization. They are certainly potent factors in the advancement of science and the enlightenment of the world. In our own business I am sure we are all impressed with the importance, in a general way, of accurate gauging of our work and progress, and of speaking from exact knowledge in our discussions. A careful record of daily operations in detail involves much care and watchfulness to avoid errors which would make our seeming results but delusions. And yet, aside from the general value of accurately ascertained facts, and their importance in practical investigations, a careful record and close study of them often opens the way to great discovery. But we may well be modest in generalizing from our seeming facts. It is hardly worth while, if our conclusions seem to indicate that previously accepted laws are not in accord with our results, to hasten to refute the theories which an age has accepted as truth, or proclaim that we have made a discovery which transcends physical law. The recent blue glass craze was founded on the acceptance by the unthinking and unreasoning multitude of a statement the correctness of which, and the tests and demonstrations where-

of, were certified by great numbers whose love of the marvellous outran their respect for law. Of late there has arisen an English philosopher whose rather mixed reasoning convicts him of a not too careful study of the philosophy he attempts to expound, and who makes the dogmatic assertion that "air cannot be heated at atmospheric pressure." He is very much in earnest, and goes to the trouble of illustrating, in his article recently published, the experiments by which he has convinced himself. With amusing egotism he asserts the new doctrine, and challenges contradiction. It was not very surprising that one single experimenter, with a superficial knowledge of the physical laws relating to his subject, should have gone astray, as he evidently did, from too hasty conclusions; but it was surprising and rather exasperating to find that he had many supporters of his theory, and that even the editor of the London *Journal* should state that no one had disproved these startling assertions. Indeed, the *Journal* seemed to give a *quasi* support to the doctrine. Now, it is perfectly well known that dry and pure air allows rays of heat to pass through it without any access of temperature; it is just as well known that air at ordinary pressure is heated with great facility by bringing it in contact with highly heated solid substances. After the subject had been discussed in several consecutive numbers of the *Journal*, and the author of the new theory had rather contemptuously rejected the refutations of the few physicists who condescended to notice the discovery, a crucial test is made, in a manner which admits of no dispute, and the pyrometer registers 975°. It would seem that a very simple experiment would convince one of the ability of air to take up heat, even in passing at great speed over hot surfaces. Remove a sight-hole plug from a flue where the hot, spent gases are passing, and observe how the ingoing air almost instantly blackens the white-hot tiles.

An admirable service rendered by our meetings is in the opportunity afforded to consult together about just such apparent discrepancies between established theories and our sometimes inexplicable experience. The confirmation of correct conclusions and the dissipation of erroneous assumption is offered here to him who modestly seeks after truth rather than notoriety.

When, in former times, the lust of gold led men to roam the seas in search of plunder, and privateers came into port laden with the spoils of piracy, the allurements of sudden acquisition of wealth so stimulated desire that the ocean swarmed with legalized robbers, and success quieted scruple. But after a time no ship was safe; no enterprise could be secured against the hazard of plundering freebooters of the sea. Capital, which had provided the outfits for the marauders enlisted in its service of spoliation, stood aghast at the logical outcome of its teachings and example. The pirates increased till they almost outnumbered the ships of peaceful trade, and the enlisted robbers even ignored the tradition of honor among thieves, and confiscated the property of their employers. Then the latter bewailed the dishonesty of the world, and an international agreement put down piracy upon the high seas.

Now the freebooters operate upon the land. Legislation is apathetic, while the craft and cunning of greed imposes upon communities, and robs the rich and poor indifferently of honest accumulation or scanty savings. Conscienceless and pitiless, vaunting its power and unscrupulousness, combined capital is seeking to destroy, by methods not more moral or reputable than the old-time pirates employed, the investments which in many cases are almost the sole reliance of those for whose protection the law ought to be effectually invoked.

How long these raids on property will be tolerated, and how much longer communities will be blind to their own interests, and legislators will fail to discriminate between the honest claims of their own constituents and the specious pretences of adventurers, no one can now foresee. But just as freebooting on the seas became intolerable, so will this land piracy be eventually suppressed, as the mutual destruction wrought by contending capital will be seen, not the blessing which it is claimed to be, under the beguiling name of competition, but the unmixed evil which comes from the destruction of property, or from rendering it wholly or partially unproductive. The constant and widespread agitation on the subject of gas supply, and the consequent enlightenment of the public in regard to the character of the business, as well as the frequent exposure and defeat of blackmailing and fraudulent schemes of many of the so-called "gas improvement companies," all tend toward the inevitable result, which, whether it come sooner or later, must eventually come—and that is the regulation of gas supply, and the guarantee of protection to investments honestly made in the business.

My predecessor in this chair last year concisely stated the advantages to be derived from governmental regulation. I wish to urge upon this meeting a reconsideration of this subject, as he presented it, and to take action to hasten the adoption of the measures recommended by him. The news of a decided move in the right direction comes from the city of Boston, where Alderman Greenough has proposed, and the proposition has been adopted, that the Legislature be asked to establish a gas commission. This comes from the right quarter; and the honor of the first just conception of the mutual obligations between communities and the gas companies who serve them, and of an intelligent and equitable adjustment of those obligations, will probably belong to a Massachusetts Legislature.

There is another subject which was called to your attention by President Hickenlooper at Pittsburgh, and upon which a preliminary report was made last year by the special committee thereon. I quote his presentment of it:

"Concentrated action should be made to take the place of the very numerous and costly experiments independently made and many times repeated."

How many of us have been over ground which already had been fruitlessly and disappointingly explored. We certainly have the means, or can command them, to acquire and maintain an expert committee, to whom should be referred the solution of questions which would baffle independent and isolated investigations, and which such committee could determine authoritatively. The confusion in the system of weights and measures in use in English speaking countries is such that we do not understand each other when we speak together. The fixing of an absolute standard of uniformity, by the committee, for our use, would go far to clear up ambiguity of statement; and the reference to them, for experiment and report, of mooted topics would shorten up many prolix contentions which unprofitably consume the time of our conventions.

Not the least valuable service which the committee of experts could render, and which their experience would enable them to make very complete, would be the formulation of a system of manufacturing accounts, which should be the standard for statement and comparison of results. Also rules for the assignment of the cost of labor, so as to have uniformity of method in its division between the different departments. While there may remain, among the less intimate acquaintances of this larger Association, a natural reserve about making full revelations of all one's business, uniformity of accounts would be a blessing to the local associations, the members of which compare notes with great freedom and minuteness of detail.

How profound would be the relief, when new processes are forced upon our attention, to ask of their promoters a certificate from our referees that all the assertions set forth by seductive circulars or beguiling parole were verily reliable and trustworthy. It might be difficult to select the committee we need from among our members, since these are generally too occupied with their own business to give the prolonged and continuous attention requisite to make technical investigations. We can recall the memory of a committee appointed many years ago to report on the processes of oil gas manufacture, which were then receiving the unqualified commendation of those engineers who had them in use. The committee did not arrive at any conclusion, although the processes did. And hence we see that such service as a proper investigating committee would give cannot be commanded gratuitously. Indeed, its cost and incidental expenses might surpass our ability as an association to pay. But the knowledge gained and the decisions reached would be of great value to the companies we represent, and few of them would refuse the small assessment, which, rated on the business done, would be insignificant. I sincerely trust that in the near future we may have a board of expert referees, who shall decide for all of us, at once, the vexatious questions of the relative economies of different materials or different methods. No discussions and comparisons among ourselves of our own work and results could so rapidly advance our knowledge and clear up contending hopes and doubts.

And now, gentlemen, I rely on the individual efforts of each, and the cordial co-operation of all, to create and sustain an animated interest at every session. We are promised papers whose titles indicate their importance; and our discussions will be, I hope, thorough and to the point. In addition to the topics of the essayists there are many subjects which arise in the minds of members whereon light is desired. A very interesting feature of our last New England meeting was the opening of the question box, followed by the answers and comments resulting from the queries which were taken from it. If any member would like any particular subject discussed, or has a question to ask, if he prefers to bring it before the meeting in writing it will receive attention at the proper time.

With the sincerest appreciation of your favor in calling me to this position, and trusting to your forbearance with my errors, I indulge the hope that this meeting will be pleasantly remembered for the profit and pleasure it will bring to every member of the Association.

REPORT OF EXECUTIVE COMMITTEE.

Mr. M. S. Greenough, Chairman of the Executive Committee, presented the following report, which was read by the Secretary, and, on the motion of Mr. W. H. White, adopted:

WASHINGTON, D. C., Oct. 14, 1884.

To the Members of the American Gas Light Association:

Gentlemen:—Your Executive Committee would respectfully report the following acts and recommendations for your approval:

The hours for holding the sessions during the present meeting to be as follows: Wednesday, meet at 10 A.M., adjourn at 12:30; reconvene at 2 P.M.

adjourn at 6 P.M. Thursday, same hours. Friday, meet at 9 A.M., and hold subject to vote of Association.

Recommend that the Secretary be instructed to proceed with the publication of Volume VI. of the Association's transactions; that he have 700 copies printed, and send two copies to each member.

Recommend that the salary of the Secretary and Treasurer for the ensuing year be fixed at $500, and his actual expenses in attending the meetings of the Association.

The following papers have been approved, and will be read at the meeting: "The Relation of Capital to the Output," by Thos. D. Gilbert; "Periodical Testing of Consumers' Meters," by C. H. Nettleton; "Natural Gas," by C. E. Hequembourg; "Valves *vs.* Centerseals for Working Purifiers," by S. G. Stiness; "Gas Stoves a Means of Revenue," by R. B. Taber; "Iron Sponge for Purifying," by H. F. Coggshall; "A Positive Cure for Choked Standpipes," by S. G. Stiness; "Registry of Meters," by E. McMillin; "Coating Gas Mains with Coal Gas Tar," by G. A. Hyde; "Notes on Chemistry of Gas Making," by E. McMillin.

M. S. Greenough,
For the Executive Committee.

REPORT OF FINANCE COMMITTEE.

Mr. John Andrew, Chairman of the Finance Committee, read the following report:

The undersigned, members of the Finance Committe, have examined the accounts and books of Mr. C. J. R. Humphreys, Secretary and Treasurer, for the year ending September 30, 1884, and find the same to be correct in every particular.

John Andrew,
Geo. S. Hookey,
Wm. Cartwright,
} Finance Committee.

On motion of Mr. William Helme the report was adopted.

REPORT OF SECRETARY AND TREASURER.

The Secretary and Treasurer (Mr. C. J. R. Humphreys) read the following report, which was, on motion of Mr. S. G. Stiness, accepted and placed on file:

New York, September 30, 1884.

Receipts.

From initiation fees	$430 00	
Dues, year 1881	15 00	
" 1882	135 00	
" 1883	295 00	
" 1884	810 00	
" 1885, in advance	35 00	
Interest on funds of Association	64 80	
Total receipts	$1,784 80	
Cash brought forward from last year	1,448 64	
To account forward		$3,233 44

Expenses.

Salary of Secretary and Treasurer	$500 00	
Expenses New York meeting	169 55	
Amount paid James R. Floyd for hospital expenses, David Douglas	100 00	
Printing and stationery	79 50	
Engrossing two sets of resolutions	30 00	
Petty cash	90 91	
Total expenses	$969 96	
Cash carried forward to year 1884-5	2,263 48	
		$3,233 44
Memo. of cash on hand—		
Deposit in South Brooklyn Bank	$1,154 27	
Deposited in Williamsburgh Savings Bank	1,039 30	
Cash in Treasurer's hands	69 91	
	$2,263 48	
Due from members, including annual dues for 1885	$1,770 00	

The roll of membership for the year shows as follows:

Active.

Members on roll October 1, 1883	241	
Members admitted, New York meeting	43	
		284
Members died during year	2	
Members dropped during year	10	
Members resigned during year	1	
	13	
Number now on roll	271	
		284

Honorary.

Number on roll Oct. 1, 1883	6
Number on roll Oct. 1, 1884	6

Deceased Members: M. H. Jones, Easton, Pa.; W. G. Cartwright, Hoboken, N. J.

C. J. R. Humphreys, Sec. and Treas.

On motion of Mr. William Helme, the report was adopted.

REPORT OF SPECIAL COMMITTEE.

Mr. J. R. Floyd—I have to report that the coachman who, at the time of our last meeting, held in the city of New York, and while driving a coach containing members and guests of the Association, was thrown from his carriage and quite severely injured, was confined in the hospital for three months. While he was in the hospital I expended fifty dollars in his behalf, and after he was discharged from the institution, I gave him fifty dollars to start him in the world again. This is all that I have expended of the sum of three hundred dollars which was appropriated by the Association for his benefit.

On motion of Mr. J. P. Harbison, the report was accepted, and the thanks of the Association were tendered to Mr. Floyd for his services.

COMMITTEE ON PRESIDENT'S ADDRESS.

Capt. W. H. White—There are very many suggestions contained in the address of our President which are worthy of very attentive consideration and action, and I move that the Chair appoint a committee of three to take into consideration the recommendations contained in that address, and report thereupon to the Association.

Mr. S. G. Stiness—I very heartily concur in the suggestion of Capt. White, and second his motion.

The motion was agreed to, and the President subsequently appointed the following members as such committee:

F. C. Sherman, New Haven, Conn.; W. H. Denniston, Pittsburgh, Pa.; and D. D. Flemming, Jersey City, N. J.

The President—There is another special committee, but I understand that they are not now ready to report because of the fact that all of the members of the committee have not yet arrived. That is the committee to which was referred the two previous addresses of the Past-Presidents. If there is no objection, that matter will stand over until the committee are ready to report.

This brings our regular business up to the point of the election of officers for the ensuing year. What action will you take in respect thereto?

COMMITTEE ON NOMINATIONS.

Capt. W. H. White—I move that a committee of five be appointed by the Chair, to report to this Association nominations of officers for the ensuing year.

Mr. S. G. Stiness—I second the motion.

The motion was agreed to, and the President appointed the following committee: Messrs. D. D. Flemming, Jersey City, N. J.; C. H. Nettleton, Derby, Conn.; T. Littlehales, Hamilton, Ontario; G. S. Hookey, Augusta, Ga.; and Marcus Smith, Wilkes-Barre, Pa.

Mr. W. Helme—I desire to ask information upon a point that I am not very clear about. I know that it was discussed once before, but I have forgotten what the result was. Are the nominations which this committee make to be considered binding and final, or are they not?

Capt. W. H. White—Certainly not.

The President—The action of the committee must be endorsed by the Association before it becomes final. The Association can, of course, take such action upon the report of the committee as it deems best. The Committee on Nominations is appointed merely for the purpose of despatching business. I think that the report of the Nominating Committee has generally received the indorsement of the Association without any question.

Such indorsement has been so usual that perhaps it has come to be looked upon as a foregone conclusion; but I do not think it is well for the Association to consider that such is the fact. The report of the committee may sometime create dissatisfaction in the ranks. While members of the Association might, as a general thing, be perfectly willing to indorse the action of the committee, yet they do not always feel at liberty to express their views upon it. I think that each member should feel that he has perfect freedom to dissent from the action of the committee if it does not meet his approval.

Mr. G. A. Hyde—Would it not be well for this committee to be instructed to recommend more than one person for each of the offices to be filled? It might be that those named by the committee would not exactly suit the Association; and if two members were nominated for each office, then we might have an opportunity of selecting the one whom we preferred.

Mr. J. P. Harbison—I hope that that suggestion will not be adopted by the Association. It would, I think, serve no good end, and would cause an unnecessary consumption of time in the matter of election of officers. The

Nominating Committee is composed of appointees from different sections of the country; and in their report they carefully consider questions of location, as well as of qualification; this being the case, I think their action may be assumed as fairly representing the views of the Convention. If any member has any suggestion which he wishes to make to the Committee, and which he thinks should influence their action, such suggestions will be properly received, and will be given due consideration. I do not think it would be well to have the Committee report a duplicate set of names.

The President—It has been the custom to authorize the Secretary to cast the unanimous ballot of the Association for the nominees of the Committee. Any member has the right to object to such action; and a single objection would invalidate such ballot. It is also in the power of any member to call for a ballot upon any particular name, or upon all the names presented by the Committee. Of course such an objection would necessitate the election of each officer by ballot, and that would consume a great deal of time. We have usually exhibited our confidence in the fairness and wisdom of the Nominating Committee by accepting their recommendations without demurrer. Of course it may not be always well to do this; nor should we consider our action in the past as establishing a precedent so binding that we cannot depart from it. If any gentleman has a candidate whom he prefers to any one named by the Committee, he has a perfect right to object to the unanimous ratification of the action of the Committee, and to cast his ballot for his choice. If there is any dissatisfaction with the nominations made by the Committee, it is entirely proper for any member to call for a ballot on any particular nomination, or on all of them.

Mr. W. Parrish—I do not understand that there is any obligation resting upon any member to vote for the nominees of the Committee.

The President—None at all.

COMMITTEE ON PLACE OF MEETING.

Mr. J. P. Harbison—I move that a Committee of five be appointed by the Chair to select and recommend to the Association a place for holding the next annual meeting.

The motion was agreed to, and the President named the following as such Committee:

John Balmore, New York city; J. M. Starr, Richmond, Ind.; J. P. Harbison, Hartford, Conn.; Thomas Turner, Charleston, S. C.; John H. McElroy, Pittsburgh, Pa.

Mr. G. A. Hyde—I think that Mr. McIlhenny has a letter which will be of interest to the Committee, and possibly shape the action to be taken.

Mr. G. A. McIlhenny—I have a letter from General Hickenlooper, inviting the Association to meet at Cincinnati, Ohio, next year. He has an entirely new works in successful operation, and he suggests that it would pay the members to come to Cincinnati, Ohio, if for no other purpose than to see his new plant.

Mr. J. P. Harbison—Is it understood that this Committee will report the first thing after recess?

The President—Such is the time that the report will be called for. If there is no further business before the Association we will proceed to the reading of papers. The first is presented by Mr. S. G. Stiness, of Pawtucket, R. I., on the subject of

VALVES *vs.* CENTERSEALS.

Mr. Stiness then read as follows:

Gentlemen of the Association:—*Via trita, via tuta*, is an old adage, and, in the business in which we are engaged, one well worthy of being remembered. While the "beaten path" may be the path of safety, it may have been traveled so long, and the ruts worn so deep, and the undergrowth so thick, that we fail to observe the open fields where the pathway is level, the journey easy, and we be permitted to enjoy alike the freedom of safety and the pleasure of wandering at our own sweet will.

And it is with feelings of kindly sympathy that I enter upon the discussion of the subject of "Valves *vs.* Centerseals" for working of purifiers, since the old-time centerseal system has been, and is still even now considered by many, as an old friend—long tried and true. In looking over the history of our business we find that, for many and many a year, the centerseal has been the beaten path which we all have traveled; and while I would speak kindly of the "bridges over which we have in safety passed," I feel that the centerseal, like many other things which were good in their day, has outlived its usefulness, and new devices more in accord with the demands of the hour will be adopted for the easy, convenient, and positive working of purifiers.

Some two years ago, being obliged to erect an entirely new plant in the works of our Company at Pawtucket, R. I., and desiring to place the purifiers in line, I became fully impressed with the idea that some system could be devised to relieve one of the annoyance occasioned by a leaky centerseal. I believed, after careful examination, that some plan could be devised whereby I would secure a system efficient in its operation, besides being inexpensive in its construction; and, further, be an arrangement by the use of which one or more purifiers could be worked in connection with others—in short, an apparatus that would allow one to work with almost any change desired. Of course, it is well known that such a practice could not be followed while working with the common centerseal.

After considerable study and examination of the matter I determined to adopt the plan or arrangement of valves and pipes as furnished by the Smith & Sayre Manufacturing Company, of New York city. This arrangement consists of a series of pipes passing under the purifiers, and valves in boxes directly under the inlet and outlet pipes of purifiers, as per diagram which I herewith submit, and will now proceed to give a brief description of their location and operation.

The first is the inlet box to first purifier; it is a double valve box fitted with one valve (a slide or clapper valve) from retort house side, the other being an extra valve, the function of which is to close communication with the inlet from No. 4 purifier to No. 1, when used in that combination, and is intended only to be a stop for the long pipe. All other inlet boxes are single, are all in line, and connected with one pipe. All outlet boxes to station meter are double, are all connected with one pipe, and also are all in line.

With the inlet from No. 1 to retort house open, and inlet from No. 4 to No. 1 closed, the gas passes up through and to the outlet box of No. 1. When the outlet valves are closed and the inlet to No. 2 is open, and inlet from main of No. 2 is closed, the gas passes up through No. 2 to outlet of No. 2, which is in the same combination as outlet of No. 1, then to inlet of No. 3; and when inlet of No. 3 to No. 4 is closed it passes up through No. 3 to outlet. When the outlet of No. 3 to meter is open and inlet to No. 4 is closed, gas is then passing through three purifiers, and direct on to station meter. If change is made on No. 3 (when fouled), the outlet to meter of No. 4 is opened, inlet from No. 3 to No. 4 is opened, and outlet from No. 3 is closed—gas is then passing through all four purifiers.

When No. 1 is to be cleaned, the inlet from retort house to No. 2 is opened, and inlet from retort house to No. 1 is closed, the inlet from No. 1 to No. 2 is closed, and No. 1 is thrown out of use, ready for cleansing and refilling. When No. 2 is to be refilled, the inlet from No. 4 to No. 1 is opened, outlet to meter of No. 1 is opened, outlet of No. 4 is closed, as also is inlet from No. 2 to No. 3, and No. 2 is out of action—the gas passing back from No. 4 to No. 1.

Only three valves are required to be opened at any change, and only three valves are necessary to shut off any purifier; and thus with ease and facility are the different operations completed. Any desired number of purifiers may be placed in line, the only necessary additions being valves and pipe connections. By making a few cross-connections, any wished-for combination could be effected.

The valves being made to act with a sliding motion, as they strike the side of the box they scrape off all the tar or sediment which may adhere to it, allowing the valve-joint to be made perfectly tight, with the consequence that no crude or unpurified gas can pass when making a change, as often happens to be the case when working with a common centerseal. The valves are placed overhead, and this disposition gives a perfectly clear space of cellar floor. They are worked by levers from floor of purifying house. All valves when open point east, when closed they point west. Marks with grips are lined on floor to show proper position and to hold levers in place.

After an experience extending over a year I am compelled to say that I could not be again tempted back into the old beaten path, as I am fully convinced that the plan above described, or some other system alike in character, will speedily be generally adopted for the working of purifiers; and this conviction is forced upon me from the knowledge that amongst the benefits to be gained in the new departure are ease of action, certainty of operation, and the impossibility of leakage. Should you agree with me in this, may I not safely claim that the new system readily proves itself far superior to the old and long-tried, but, nevertheless, inefficient centerseal?

Mr. Stiness added that the diagrams he submitted would better explain the working of the system he had in use than any possible verbal explanation he could make. He asked the members to inspect the diagrams carefully.

Mr. M. N. Diall moved that a vote of thanks be given to Mr. Stiness for his very interesting paper.

The motion was unanimously adopted; and President Stedman announced that Mr. Stiness held himself in readiness to answer any questions that might be asked with reference to the subject treated of in the paper.

[This discussion will be given in the next issue of the JOURNAL.]

[To be continued.]

GLASS SHEATHING FOR SHIPS' HULLS.—*Popular Science Monthly* claims that an Italian ship has been sheathed with glass plates, cast like iron, so as to fit the hull, to take the place of copper sheathings. A water-proof mastic is used for jointing the plates. The advantages claimed for the new material are insensibility to oxidation, and exemption from incrustation.

The International Electrical Exhibition at Philadelphia, Pa., Held under the Auspices of the Franklin Institute, of Pennsylvania.

By H. C. Adams.

Number III.

The Siemens Gas Lamps.—As the visitor strolls casually through the aisles of the Exhibition buildings he comes suddenly upon a series of lights very different from those he has been viewing, and which, while seeming to emit a very large amount of light, yet afford an instant and appreciable relief to his eyesight. At first thought the vast majority imagine they behold a newly modified and more tolerable electric light; they perceive that the new lights are far larger and more diffusive than the largest incandescent lamp systems previously inspected, and that, at the same time, they are infinitely more pleasing than the arcs. So, for a time, these good people are nonplussed; but finally they discover that they have not been gazing upon an electric light at all, but upon a gas lamp consuming the very same gas that they burn daily in their homes. They are then doubly surprised, for they by no means expected to find gas lights at an electrical exhibition; and still less did they think to find them giving a light equal to the high-power electric lamps of whose phenomenal intensity they had heard so much. Ninety-nine out of every hundred of these visitors never knew that such things could be; they believed that the limit of gas illumination was reached in the ordinary chandelier-jet or the Argand burner. Upon inquiring how the extraordinary result before them is obtained, the knowledge is gained that they are gazing upon the exhibit of the Siemens Regenerative Gas Lamp Company, of Philadelphia, Pa. That this Company should have selected to illuminate the restaurant was certainly a happy decision; for when the wearied sightseer turns to the spot wherein he may rest and refresh himself, and having accomplished these ends, he naturally finds himself in a very proper mood to appreciate the merits of the pleasant light with which he is surrounded.

In the room illuminated by their method the Siemens Company have placed six 500-candle power lamps, arranged at proper distances along the ceiling; at their desk are two more 500-candle lamps upon standards, and in the space railed off for their exhibit are scattered for inspection the different sizes of lamps manufactured. Of the construction and operation of those we shall now give some account.

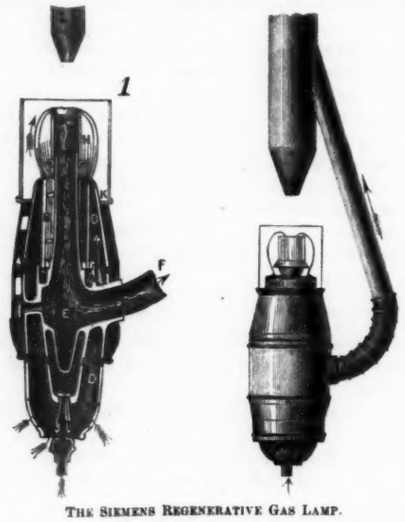
The lamp, as is well known to gas engineers, is the invention of Frederick Siemens, and the principle embodied in it is that which is of familiar application in the Siemens gas furnaces now so largely used throughout the country in steel and glass melting, and in other metallurgical and chemical processes where very intense heat is required. We should premise our explanation of what is aimed at by stating that the physical products of combustion are two—light and heat; and while the Siemens Brothers endeavored in their furnace to produce, by perfected combustion, the most effective heat, so in the lamp they have striven to produce the most effective light with a given expenditure of energy.

The escape of highly heated products of combustion from the stacks of furnaces, carrying off and wasting great quantities of caloric, has long been a source of annoyance to our manufacturers; and it is by the utilization of those otherwise wasted products that the great economy of the Siemens furnace is obtained. In the lamp the process is analogous, with the exception that effective light, instead of effective heat, is the end in view.

To illustrate the direction in which the economy is accomplished, let us say that illuminating gas requires a temperature of 1,000° for combustion; well, then, it is obvious that all the combustibles entering into that action must be brought to such temperature before securing thorough effectiveness, and that when they are fed in under ordinary conditions the energy of combustion must be largely drawn upon, and its effectiveness greatly diminished. But in this lamp, instead of allowing the heated products of combustion to pass off unused, they are directed and applied so as to raise the combustibles—that is, the gas and air—to a high temperature before they reach the point of ignition. By just the degree to which that is done, so much the less do we draw upon the energy of combustion of the gases in the flame. It is well known that the amount of light emitted from such a source depends upon the rapidity and completeness of combustion; and as height of temperature determines that rapidity and completeness, a most evident and fruitful economy is obtained by the preheating of the combustibles. Let us now see how that theory is practically applied.

The body of the lamp is a cast iron shell, of eliptical form. Projecting above the upper end, and running down to the middle of the lamp and thence out of the side by an elbow, is the central or return flue. At the lower end of body of lamp is a connection, made to receive an ordinary gas pipe; from that the gas flows up into a chamber immediately below the elbow of the return flue, around which it passes through ducts, and then enters a series of small tubes arranged equidistant in a circle about, but at a little distance from, the upper part of the return flue. The air enters also at the bottom of the lamp, through a series of inlets, and flows up outside of the gas chamber, between it and the outer shell of the lamp, around the elbow, and up outside the gas tubes, and also inside and between them along the central flue. Thus it will be seen that a copious supply of air is provided, and that it is well mixed with the gas at the point of delivery.

On the outside of the central flue, a little below its top, where it projects above the body of the lamp, is a flange or rib, upon which rests a porcelain cylinder, varying from about 2 to 3 inches in height in the different sizes of the lamps; around and just a little below the base of that cylinder is the point of delivery of the gas and air. When, in starting the lamp, the gas is turned partially on and ignited, the flame burns like an ordinary Argand burner around the base of the cylinder; as the lamp becomes heated the gas is turned on full, and the flame rises to the top of the cylinder. At a point a few inches above the burner of the lamp depends a small flue, connected



The Siemens Regenerative Gas Lamp.

A, gas chamber leading to gas tubes; B, gas tubes; C, exit for gas supply; D, air chamber; E, regenerative heating chamber; F, suction chimney leading to main chimney; G, main chimney.

with the main chimney, and having a small reversed funnel-shaped orifice in its lower extremity. Just above that orifice is brought into the pipe an arm from the elbow of the return flue, which, as we said, was led out through the middle of the side of the lamp. The area of the mouth of this arm where it enters the main chimney is much larger than that of the small funnel-shaped orifice below it. Having that fact in mind, we can readily discover how the reversed draught is obtained. When the gas reaches the top of the cylinder it raises a great column of heated air, which ascends rapidly through the funnel and chimney, creating a partial vacuum; to supply that, both the mouth of the elbow-flue and the orifice contribute; but as their areas are so disproportionate, the greater volume of air rushes into the chimney through the side arm, such action, of course, causing a strong draught down the central flue; the top of the flame follows it, and is drawn up over the top of the porcelain cylinder and down into it an inch or so. When this is once accomplished, the great rush of the heated current of air traversing the central flue maintains the draught in that direction—down through it, out by the elbow and arm, and thence up into the chimney above the lamp.

The constant flow of these products of combustion at high temperature through the body of the lamp heats thoroughly the gas and air chambers, and thus their contents, flowing to the point of combustion, are very much raised in temperature, and in that highly heated condition reach the flame and contribute to the saving of energy, the perfection of combustion, and the consequent emission of a pure, brilliant light. By the prolonged flow of the flame over the porcelain cup the latter is raised to partial incandescence, and by that background, as well as from the conditions under which it is burned, the light receives a clearer, whiter tinge than is usually observed in flames emitted from gas jets.

The whole body of the lamp is surrounded by a jacket or casing of nickel-rolled iron, which allows of the flow of a current of air that envelops the regenerating portion and prevents overheating. Upon the top of that casing, at a little distance from the porcelain, is a glass cylinder which extends above the flame and protects it from wind or local draughts. For outdoor lamps a closed clear globe is provided, the globe extending from the body of the lamp to the dependent chimney, and thus effectively protects the light.

These lamps can, of course, be placed in any desirable position. They may be erected upon ordinary posts in open spaces or out of doors; or they

may be suspended from overhead in factories, offices, halls, churches, houses, etc.

Fixtures of tasteful design, suited to the various situations, are manufactured by the Siemens Company. There are plain lamps for shops and factories; ornamental lanterns for out of doors; and lastly, many handsome styles of canopy lamps for suspension from ceilings, etc., in the carrying out of indoor lighting. For the sake of symmetry, two side-arm flues are used in the ceiling lamps; but in nearly all the others the single arm first mentioned is all that is seen. Six sizes of burners are now made, varying from a consumption of 12 to 14 feet per hour, with 125-candle power light, in the smallest, to a consumption of 100 feet per hour, and a candle power of 1,000 to 1,200, in the largest.

That statement of gas consumption and candle power brings us to the consideration of what these lamps accomplish as illuminators. From our description of the arrangement of the burners it will be seen that the light is emitted from a cylinder of flame appearing, as some writer has aptly said, "in shape like a huge magnolia blossom, and has the serenity of the harvest moon." The light is clear, steady, soft, full, and diffusive. In its qualities we observe none of those characteristics previously found so objectionable in the electric light. There is, first, absolute steadiness in the gas lamp's flame, and not the faintest variation can be observed; should the length of the flame vary slightly, through any sudden change in pressure, the fact that an inch or more of its top is drawn down within the porcelain cylinder serves to confine that variation there, while the light-emitting body of the flame remains unaltered in size. In the second place, it is reliable; we have neither "bobbing," "flickering," "hissing," nor "sputtering," nor any sudden and periodical partial extinguishments such as we observed in the arc lamps. Then, instead of an intense blue and white glare, we have a soft, full glow of light. Compared with the electric lamps, the Siemens burners are, in fact, much more suited to the physical construction of the eye.

The far larger radiating surface, proportionately to the light emitted, that is found in the gas lamps, serves to diffuse the light thoroughly, and also to merge and subdue the shadows about it, in marked contrast to the clearly defined, dark shadows of the arc light. It is claimed that the electric lamps distribute the light to a greater distance; but we may reply that, except in a few isolated cases, the purpose of illuminating lamps is to light thoroughly, and with as few and subdued shadows as possible, the space immediately about them, and not to give "blind-man's holiday" over an acre.

Another incidental advantage is that the Siemens lamps may be turned up or down by a key placed in a convenient position, and so an amount of light adapted to the pleasure of the consumer may be had. In the use of the electric lamps (both arc and incandescent) it has been shown that one must have the full candle power or darkness; there is no means of regulating the intensity of any single lamp. Safety is another consideration of no small moment. There are no wires to overheat through faulty mechanism, and no fatal shocks to be received through ignorance or inadvertence on the part of the consumer.

One of the most widely bruited advantages of the electric light, and especially of the incandescent system, is its character of neither heating nor vitiating the atmosphere of rooms or halls where it is used. Now, the Siemens lamp meets this advantage and surpasses it; for not only does it not vitiate the atmosphere, but it accomplishes a purifying ventilation that electric lamps do not, and, by their very nature, cannot. Where the gas lamps are used indoors, there is around the top of the flue, where it enters the ceiling, a series of outlets from the room to the flue. Thus whatever heat is radiated from the lamp at once ascends th o·gh these orifices, and the current so induced, as well as the draught through the flue, serve to carry off the air of the room that may have become vitiated from the presence of many people, or from whatever other cause; and this method thus induces the gradual and constant change of atmospheric conditions so necessary to comfort and health in halls, churches, or like places of assembly, where great numbers of human beings have so frequently suffered from the effects of continued breathing of an atmosphere more or less overheated and befouled.

So we might run on through a long list of advantages, some of them purely circumstantial, which this simple and perfected lamp has over the intricate and unreliable appliances of electricity.

From the list of burners and their consumption relative to the candle power, it will be seen that the regenerative principle accomplishes the unprecedented result of ten candle power to the cubic foot of gas consumed, or threefold that obtained from ordinary jets. The economy of such working goes without saying. The consumer, with the figures before him, may readily work out comparative costs, without taking into the question abstruse details that the electric systems necessitate, and on which he may readily go or be led astray.

If, in this question of comparative cost, the ordinary incandescent lamp can scarcely hope to compete with the ordinary gas jet, much the less can the high-power incandescent lamps compete with the economy and efficiency of the Siemens burners. In the arc lamps there are so many disqualifying characteristics as to make us believe the system will in a few years be removed altogether from the field of competition in illuminating; but when, as at the present time, cost is determined on actual practical, and not upon theoretical, results (and upon all points of efficiency), we do not think that ths gas engineer need fear to stand by the comparative showing of these high-power gas lamps.

The use of the lamps has spread in this country with almost electrical rapidity. The Siemens company commenced manufacturing them here only in last March, and already there are 1,500 in use. The display at the Electrical Exhibition, in the midst of the electric systems, is the best evidence of the confidence of the manufacturers in their lamps, and the result of the exhibit there has been most fortunate. It has proved that these lamps need only to be seen to be appreciated. During the progress of the Exhibition the Siemens Company have received, outside of hundreds of inquiries for estimates, actual orders for over *two hundred* of their lamps to be placed in various halls, churches, stores, factories and public places *in Philadelphia alone;* and this result may be traced to the fact that many people who had large spaces to light deferred their decision until they could judge of the respective merits of the numerous electric systems at the Exhibition, and coming there with that end in view have, after inspection, chosen the gas lamps as the cheapest and the best. We are confident that wherever these lamps are placed, so as to make a comparative showing before the public, there will result just such a demand for them as has arisen here.

(To be Concluded.)

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, Oct. 10, 1884.

When one looks over the number of meetings that are held in this country during the year for the purpose of discussing matters relative to the gas industry, it is, perhaps, natural to feel a little disappointed that our progress is not more marked, and that so many interesting and important problems in connection therewith yet remain unsolved. There is "the Gas Institute," holding an annual meeting of three days' session, and comprising some 800 members; the Manchester District Institution of Gas Engineers, meeting every quarter, and composed of about 90 members; the Midland Association of Gas Managers, also meeting every three months, and having something over 50 members; the North of England Gas Managers' Association, holding two meetings a year, and numbering more than 100 members; the Southern District Association of Gas Engineers and Managers, having four meetings per annum, and comprising nearly 70 members; and the Southwest of England District Association of Gas Managers, which meets every half year, and in numerical strength is about the same as the Southern. This completes the list of English associations, but we must not forget our Scotch neighbors. The West of Scotland Association of Gas Managers, and the North British Association of Gas Managers have recently clubbed together under the latter title. During the year 1883 these seven Associations held nearly twenty meetings, at which upwards of forty papers were read and discussed. This does not include about half a score of Presidential addresses. No other evidence is needed to show that gas engineers are taking a lively interest in their business, and are exerting themselves to the utmost on behalf of their employers' interests.

There are some signs that the "Gas Managers' Association Meetings" are rather overdone. Some of the secretaries find a difficulty in securing papers, and sometimes the meetings have been held without any papers at all; or sometimes the president has had to lengthen out his "address," so as to fill up the whole time allotted for the meeting. Particularly in the discussions a tameness and want of vitality is occasionally noticeable, the spirit and warmth that used to mark these in days gone by being absent, together with much of the solid practical information for which the discussions at the earlier meetings of the British Association of Gas Managers are specially noted. In one or two cases there is a tendency to degenerate the meeting into a sort of "bean feast," or "outing," only about two hours out of the day being devoted to the business meeting, and perhaps double that time spent at a dinner table over a sumptuous, formal and uncomfortable dinner —reminding one of Bombastes' regiment of half a dozen men, of which four were required for the band. Not that I have anything to say against meetings for pleasure and social enjoyment—why should not gas managers have them as well as other people?—but it is not dignified to hold such under the guise of "business" meetings. These, however, are exceptions, and for the greater part the meetings are good business meetings, productive not only of enjoyment, but also of profit; and so long as this obtains, the more meetings the better.

Four district association meetings have recently been held, viz: the "Southwestern," at Bournemouth, the "Midland," at Birmingham, the "North of England," at North Shields, and the "Manchester District," at

Huddersfield. Three of these Associations went out of their regular course to discuss the present phase of the affairs of the Gas Institute with regard to the proposed alterations in the rules, particulars of which I gave in my letters for July and August. In each case a more or less animated discussion took place, showing that the alterations are a question respecting which party feeling runs high. The proceedings at the meeting of the Manchester District Association were exceptionally interesting in character. They comprised a visit to the works of Messrs. W. C. Holmes & Co., a well-known firm of constructing gas engineers, and to the works of the Colne Vale Gas and Drysaltery Company. The latter claims our special interest, as it appears to consist of a combined gas works, chemical works, and cloth mill. This strange combination arose from the fact that a large number of mills exist in the district, and that when the gas undertaking was first established the price of gas was necessarily high, on account of the unequal demand in winter and summer, a large portion of plant having to stand idle during the greater part of the year. To avoid this waste by utilizing some of the plant for other purposes, a combination of mill owners was formed under the above title to buy up the gas company. The plan of working appears to keep the same number of retorts going winter and summer all the year around, working at low heats, so as to produce a large yield of tar and liquor. The retort furnaces are so arranged that they can be fired either with coke, in the usual manner, or by means of the surplus gas; the change from gas to coke, or *vice versa*, being made in a few minutes; so that the whole of the furnaces may be heated by gas, in which case the whole quantity of coke produced is available for sale; or if all the gas is wanted, coke can be used entirely for firing. Nearly three times as much gas is produced as is actually required for supply in the ordinary way, the remainder being used as above. As showing the wisdom of this way of working it may be mentioned that, without allowing anything for the gas, the cost of the coal, purifying materials, wages and tools, is covered by the amount realized for the residuals. One thousand cubic feet of gas are equal in retort heating effect to about one cwt. of coke, and if gas alone is used as fuel, the whole of the gas produced is needed to keep the furnaces going. A cheap, inferior kind of coal is used, but it makes good coke, and produces a large yield of tar and liquor. The waste heat from the retorts is turned to account for raising steam, a multitubular boiler being fixed between the stack and the chimney; it is thus used to raise steam equivalent to 60-horse power. There is also a boiler heated by a furnace specially designed to burn breeze or small coke. Six beds, each comprising seven retorts, are used, and each retort is charged with 2½ cwt. of coal every six hours. The waste heat from each retort setting is therefore capable of raising steam in sufficient quantity to work a 10-horse power engine; or, in other words, all the power needed about a gas works could be readily furnished by the waste heat from the retort settings. There are few gas works where a hundred weight of coke is not of much less value than 1,000 cubic feet of gas; but the fact that 10-horse power is going to waste up the retort-house chimney is worth taking into consideration under all circumstances.

Some excellent papers were read at the meeting of the North of England Association. Mr. W. J. Warner, of South Shields, gave a most interesting account of the procedure by means of which he had been successful in altering the position of some main pipes without breaking joints, or any escape of gas.* It was decided to take off the highest part of a steep hill to the extent of 12½ feet; and in the roadway, which included this hill, there were two lengths of gas mains, one 18-inch, and one 10-inch. The alteration necessitated the lowering of a length of 440 feet of each main, and this was effected without taking any of the pipes apart, and only a temporary stoppage of the gas supply, and at a total cost of about £28. Any gas engineer, about to lower or otherwise alter the position of existing lengths of main pipes, will do well to read the full account of this ingenious piece of gas engineering as supplied by Mr. Warner's paper. Mr. J. Whyte, of Seaham Harbour, followed with a paper on "The Use of Portland Cement in Gas and Water Works," giving an account of the successful application of that substance for the joints of steam pipes, and the plates of a small cast iron water tank. Two socket pipes were also jointed together with the cement, and tested after allowing time for setting; the joint stood a pressure of 1,000 lbs. without showing signs of leakage. The last paper read was by Mr. J. Wright, of Stockton-on-Tees, and consisted of an account of Green's improvements in tower scrubbers. The principle of these consists of using canvas screens on wooden frames placed perpendicularly, at short distances apart, in a similar manner to boards placed on edge; as canvas is thinner than board, Mr. Green is able to put a larger number of screens in a given area as compared with boards, and thus obtains a greater area of scrubbing surface, and at a cheaper cost. In a scrubber 10 feet in diameter, and 40 feet high, packed on this system, there is an effective scrubbing surface of 187,000 square feet, or 100 per cent. more than that obtainable with boards. After giving these particulars it is superfluous to add that the proceedings were most instructive and entertaining to all present.

* See foot of last column, this page.

Some of the members of our rather numerous family of gas magazines have been exercising their minds lately on the subject of "Cooper's Process," probably having had their attention directed thereto by the recent publication of a little work from the facile pen of Mr. R. P. Spice, entitled "A Treatise on the Purification of Coal Gas, and the Advantages of Cooper's Coal Liming Process," which treats of gas purification generally, and of Cooper's process in particular. I am not able to ascertain that any new results of experiments beyond those already published are at present forthcoming. It is not for me to say whether the process has, or has not, received justice at the hands of those who have already tried it; at present it seems to be attracting but little attention amongst the profession. Further information as to the results it is capable of affording in practice will no doubt be forthcoming in due course. It could not be in better hands for having its good points brought forward and made the most of.

A long and in some instances rambling correspondence has already appeared, and is still being continued, in the columns of the *Gas Journal*, upon a subject that bids fair to become known in gas world history as "Valon's Theory." The chief point is that Mr. Valon claims to be able to prove that "regeneration," or "recuperation," as it is now more appropriately called, is not of much if of any practical value; seeing that air is not capable of taking up, and therefore of conveying, any considerable quantity of heat. So Mr. Valon says, and thus has ruffled the feathers of some go-ahead gas engineers, who have put down expensive recuperative plant on a large scale; and certainly it is not very soothing to one's *amour propre*, after having put down a costly and terribly scientific recuperative plant, to be told that recuperation is not of much practical account. While Mr. Valon's experiments and calculations have been attacked and criticised, they have not yet been refuted, nor has any suggestion been made as a means of conclusively settling the matter. Under these circumstances the editor of the *Gas Journal* has come forward with a good suggestion that a competent committee should be appointed by the Council of the Gas Institute with powers to examine the whole matter. The subject is one that is well worthy the attention of such a committee, and if the suggestion is carried out their report cannot but furnish useful matter for gas engineers generally. Looking at the cost of some kinds of recuperating plant that are being introduced and recommended for use in gas works, it certainly seems desirable that we should have full information as to the advantages to be gained by its use.

The electric light has been tried at Cleethorpes, a contract having been entered into by the local authorities for the lighting of certain streets, in consideration of the sum of some £200 per annum. The light of the future has not been more successful in Cleethorpes than it has in the streets of other towns; at least so much may be inferred from the fact that the inhabitants are much dissatisfied, and consequently the lighting committee have decided to serve a notice on the electric light contractors, to the effect that unless the lighting is more satisfactorily carried out, the agreement must be concluded. Another name is to be added to the victims of electric lighting. Henry Pink, an attendant in the dynamo shed at the "Health Exhibition," now being held in London, in some manner managed to receive a shock from one of the machines of such violence as to cause his instant death. The coroner's jury returned a verdict of accidental death, but expressed an opinion that a notice to the effect that "the machine should not be touched with both hands at the same time," should be posted up. So far as can be judged from the evidence, it seems that the deceased, while doing something to the collecting wires with one hand, grasped one of the standards of the machine with the other, and so directed the current through his body. Electricity appears to be more dangerous than high pressure steam, highly compressed air, or any other force that has been turned to practical account.

Experience in Altering the Position of Gas Mains.

At the fifteenth semi-annual meeting of the North of England Gas Managers Association, Mr. W. J. Warner, of South Shields, read the following paper on the above-named subject. The reprint of same is taken from the London *Journal*.

The chief object of such gatherings as the present is to make individual experience common to those associated together in a common calling. With this object in view, I did not hesitate to accede to the request of your committee to contribute a paper, though the subject would, I felt, be little more than a trifle. As such please accept this paper.

Some very valuable papers on distribution and main-laying have from time to time been contributed to the "Transactions" of what has now become the Gas Institute. In none of these do I find any reference to the work which I have to lay before you. The nearest approach to the subject is the various opinions which have been expressed, and which have been formed by individual experience, on the capabilities of turned and bored pipes to the adaptation of the varying requirements of practical work. As the views upon

the subject are varied, I will refresh your memories by quoting the most striking.

In 1867 Mr. G. Anderson said: "On the whole, I prefer turned and bored joints, where I can apply them—*i. e.*, when I have straight lines, no heavy traffic, and sufficient depth to prevent the temperature of the atmosphere varying the pipes' length and splitting the sockets." Mr. Irons, of Gosport, said: "He had had a little experience with turned and bored joints, and had a considerable amount of trouble with them in this way: The soil in which they were laid was very shifty—not a firm soil; and the sinking of the soil caused the spigot end to draw from the socket." Mr. J. Paterson, of Warrington, "felt disposed to prefer turned and bored joints when they could be laid in straight lines." Mr. Cockey, of Frome, said: "Unless the road was very straight, it was difficult to use turned and bored joints."

In 1868 Mr. Rafferty, of Manchester, said "it was astonishing to what an extent of curve such joints [turned and bored] could be applied."

In 1873 Mr. Emmerson, of Darlington, said: "If the ground were hard, and the line of pipes straight, nothing could be better than turned and bored joints."

In 1883 Mr. G. E. Stevenson, of Peterborough, "considered that turned and bored joints were most suitable for large-sized pipes, but did not think flush turned and bored joints were so suitable for very small ones, because the joints were so perfectly rigid. They could be made to go round curves as easily as lead or composite joints." Mr. G. Livesey said: "At first he used the recess socket; but on speaking to Mr. King [of Liverpool] about it he was advised not to do so, because it was difficult to know for certain when the joint was 'home,' whereas with a flush socket this could be ascertained at once. On talking to his men respecting it, he found their opinion was that with a recess socket they could more easily get round a curve than with a flush one."

About two years ago it was decided to alter one of the main thoroughfares in South Shields, and plans were prepared by the Borough Engineer (Mr. M. Hall). The work consisted of removing the highest portion of a heavy hill to the extent of 12 ft. 6 in., and widening the roadway 25 feet. On one side of the road was the goods station, 45 feet above the level, when completed; on the other hand a high ballast hill with houses on the top, the total height of which is 85 feet above the present level. As the fronts of the houses are but 23 feet back from the pavement, it will be seen that very heavy retaining walls had to be put in at some depth below the finished level. As this road is the direct one to Jarrow and Hebburn, two of the leading mains were laid along it—one an 18-inch, the other a 10-inch; and these had to continue in use during the alteration.

The plan determined on was to level the road to the bottom of the mains; then, as the two mains were on one side of the road, being that with the heaviest embankment, to level the other side and put in the foundations The second side was then to be proceeded with in sections, the footings put in, and the road leveled to what was required: It was determined to support the mains by timber as the cutting proceeded. Now, as the longitudinal section gave the form of mains as an arc of a circle, it is obvious that to have lowered them perpendicularly would have necessitated cutting them. It will also be obvious that the arc could be turned on its chord; in other words, considering only one main, the form of it in its original position above the new level of the road was that of a crank, with the untouched portion of the main as a shaft on which the crank might turn. On this principle we effected the alteration of position.

The timbering was pieces of old plank, battens, and other old stuff lying about, as used by the contractors—some on sole pieces, on which the planks were placed on end, directly under the pipes; and others as struts, right and left, nailed together. What I wish to convey by this is that no formal or costly timber work was designed or used, but the pipes were supported by what we had at hand. Having the power of by-passing these mains for the day supply, we bladdered the main, as a precaution, at the two ends of the uncovered pipes while lowering. There was, however, no need for this, as there was not the least unnecessary disturbance of the joints, nor any escape of gas during the operation.

The procedure of lowering was to work gradually from one of the ends. Secondary chocks and supports were placed under the main at gradually varying distances from the pipes they had to support; and the first ones were then carefully removed, lowering the pipes into the new supports, at the same time keeping the joints well sealed by pressing the "bow" towards its chord. In this manner the mains were lowered on to the new surface of the road. The trench was then cut gradually along the whole length, and the mains gradually lowered into their final resting-place.

The length of the work was 440 feet. This doubled for the two lengths would make nearly 900 feet. The cost was about £28, which reduced brings the outlay to something like 1s. 10d. per yard for the work. The bill was £28 7s. 9d.; but as this included some items which did not belong to the work of the main, the exact cost would be somewhat less than the above figures.

The joints of the 18-inch main are turned and bored, recessed, and had been laid about fifteen years before the alteration. The 10-inch pipes had ordinary lead joints. Both were equally sound when finished, and were, I may call it, equally flexible.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Something from Massillon, Ohio.—The figures given in the annual report of the Providence (R. I.) Gas Light Company have attracted much attention, as witness the statement made by Mr. Geo. Cornell, of Youngstown, Ohio (in Oct. 2d issue), in which he furnished the information that his company had beaten the Providence company in the matter of returns for residuals by some eight per cent. Now, Mr. A. M. Hopper, Secretary and Superintendent of the Massillon (Ohio) Gas Light Company, comes to the front with his figures. In his letter to us on the subject Mr. Hopper says: "Having noticed something from neighbor Cornell, in a recent issue of the Journal, to the effect that the receipts of the Youngstown Gas Light Company for coke, tar, etc., reach to about 41 per cent. of cost of coal carbonized, I would like to say that the Massillon Company can 'go him one better,' since our returns for residuals sold in 1883 amounted to 42 per cent. of cost of coal worked. At present we have in our city an electric lighting concern the proprietors of which have put up (in the nature of a sample, so to speak,) ten lights on the principal thoroughfare. These lights are to remain on trial for a period of sixty days, and the idea undoubtedly is the forerunner of an attempt to secure either a portion or the whole of our street lighting in the future. The Brush system is the one in use, and the lamps are hung from a 'stretcher' passing over the centers of the streets. The light, or rather what we get of it, appears to be good enough, only it appears to be manipulated on the principle of 'now you see me, and now you don't;' and this, as one may readily imagine, is rather unsatisfactory to the traveler on foot. We have 112 gas lamps and posts, and we are charging the city for the gas supplied at the rate of $1.95 per thousand—the total cost of the lamp service per annum amounting to $1,786. This we consider to be a pretty low figure, making due account of the size of the locality. I will write you again when the electric lighting folks put in their proposal." This is the sort of news to send along; and let us hope that Messrs. Cornell and Hopper will find plenty of imitators.

Incorporating a Gas Company.—A certificate of incorporation was filed at Albany, N. Y., on date of Oct. 20th, giving official existence to the Brighton Gas Light Company. Its operations are to be carried on in the town of Gravesend, Kings County, with headquarters in New York city. Its objects, as stated in the certificate, are to be the manufacture and sale of illuminating gas, and the purchase and improvement of real estate. Capital stock of the company is fixed at $250,000, divided into 2,500 shares. The incorporators named are Messrs. Isaac D. Guyer, Lemuel H. Wilson, and James W. Barker. Gravesend is located on the southwestern end of Long Island, not far from Coney Island, and is about five miles distant from the city of Brooklyn. It is not supposed that the Brighton Company will begin the work of building before next spring.

An Explosion of a "Naphtha House."—A despatch dated Lawrence, Mass., Oct. 16th, says that the city was shaken by a violent explosion that occurred in the naphtha storage house of the Central Pacific Mill. The storage house was blown into fragments, and the windows on the east side of the mill proper were shattered. Two employees named Hart and Malcolm were so badly injured that their recovery is doubtful. Fire broke out in the main building, but the flames were speedily quelled by the exertions of the mill fire brigade, still the damage occasioned will reach into the thousands. The trouble originated in an ignition of naphtha gas, fired from contact with lighted lamps carried by the injured men.

To Look after the Electric Light in Theaters.—The Fire Commissioners of New York city have at last awoke to the importance of keeping a watchful eye upon those theaters where the electric light forms a part of the method of illumination. Perhaps the Niblo's Garden affair (reported in our number for Oct. 16) may have had something to do with it. At any rate, the Commissioners recently ordered that an employee, familiar with the electric light system, must hereafter be present at each theater performance where such light is employed. A sensible move.

Why the Oakland (Cal.) Gas Light Company Called in its Old Stock.—Among the other statements contained in our report of the state of the market for gas securities, published in issue of Oct. 2, it was noted that the Oakland (Cal.) Gas Light Company had called in its old stock to be exchanged for shares into a concern known as the Oakland Gas Light and Heat Company, and further said that no radical change would be made in the affairs of the original corporation, since the change was supposed to be

in the nature of a patent right "deal." The surmises have proven to be correct, although the patent rights secured were somewhat of a different nature to those that we thought had been purchased. It appears that the charter of the original Oakland company has been so amended as to include the generation, transmission and sale of electricity, as also "to produce, conduct, use and sell steam and steam power, and generally to engage in the business of producing, transmitting and selling light, heat and power, and to construct, purchase and sell all the apparatus and appliances necessary for making, transmitting or using the same." The correspondent who kindly furnished us with the reasons which led to the change says that the Oakland folks acted on the same principle as that followed by one of California's eminent pioneers of the "good old days long gone by." The aforesaid "eminent pioneer," at one period of his history, kept "store" in San Francisco, and he was once asked by a new-comer what articles the people in the vicinity most often called for. The answer was: "Well, my friend, I deal in the two staple necessities. When my customers don't want to buy whiskey, I sell them bread." The Oakland Gas Company consequently have placed themselves in such a position that they may hereafter sell either gas or electric light. They have purchased the right to use the Thomson-Houston system, and are at present furnishing several lights to the people of the place. The officers of the Oakland Gas Light and Heat Company are as follows: Messrs. Jos. G. Eastland, President; John A. Britton, Secretary; Van Leer Eastland, Engineer and Superintendent.

THEY DO NOT LIKE IT.—The Albuquerque (New Mexico) *Democrat* is indulging in some lively remarks about the spasmodic action of that city's electric lights.

PUTTING UP THE PRICE OF GAS.—The agreement recently reached whereby the two hitherto antagonistic gas companies doing business in the city of San Francisco, Cal, have placed the selling rate at $2.25 per thousand, has naturally enough exerted a very favorable influence on quotations for shares. San Francisco gas has sold up as high as 68, with unusually large transactions; prices have now receded somewhat, but the tone of the market keeps strong. On October first the new gas rate was to have gone into effect, and consumers who have been paying but $1.50 for a long while back, do not seem very greatly discontented over the outlook. Neither should they, for gas at $2.25 in San Francisco ought to be considered cheap enough. We understand that the outlook for the gas maker on the Pacific slope is very bright and promising.

"CAP." WHITE TO OPEN AN OFFICE IN NEW YORK CITY.—"Cap." W. Henry White has secured an office at Nos. 30 and 32 Pine street, New York city, in one of the buildings formerly owned by the Goold Hoyt estate. His door-plate bears the inscription, "Room No. 30." He announces himself as ready and "willin'" to undertake anything in the line of gas works construction.

A LAMPLIGHTER KILLED.—Michael Crowley, a lamplighter, while performing his round of duty at New Brighton, S. I., on evening of Tuesday, Oct. 21, mounted a ladder that he had placed against a lamp-post. The cross-piece of the post broke and Crowley fell to the ground. His head struck the curbstone, his neck was broken, and death resulted immediately. Had the Richmond County Gas Light Company better not buy a torch?

THE BALTIMORE (MD.) AGREEMENT.—As near as can be ascertained, in regard to the basis on which the Baltimore war of gas rates was terminated, it appears that the Consolidated Company managers have the least to complain of. It is understood that the Equitable Company is to supply gas within the limits of certain territory in which it has already operated, but is restricted to an annual send-out of 213,000,000 cubic feet. The estimate on which this apportionment was based places the entire output of both companies at 920,000,000, and the quantity assigned to the Equitable being deducted therefrom leaves the Consolidated to supply an aggregate of 707 millions. There is some talk as to the possibility of the Equitable Company buying its supply from the Consolidated, after the manner followed by certain companies in Brooklyn, N. Y., but this talk is probably without any foundation other than that which exists in the minds of stock jobbers.

THE USUAL NEWS FROM LONG ISLAND CITY AND NEWTOWN CREEK.—On the night of Saturday, October 19th, as Michael Rodon, a resident of Long Island City, was walking along Tenth street, and had reached a point just above the Standard Oil Works, he was startled by an explosion that had force enough to throw several sewer manhole plates into the air, besides damaging the plumbing work in a number of houses in the vicinity. The uncapped sewer vents blazed up like miniature volcanoes for a time, and Rodon was unfortunately near enough to one of them to be rather severely scorched about the face and hands. The trouble was caused by the ignition, in the sewer mains, of naphtha that had found its way into the drains from the Standard refinery. We thought Dr. Dennler was to have this matter remedied. Perhaps he finds it more profitable to take care of those who receive injuries from such explosions. Rodon is the third person to be maimed in this way while going about his business through the streets of Long Island City within the space of six weeks. The second instalment from the same highly favored locality conveys the news that, at 11:30 o'clock, on the night of October 23d, a large agitator at the Kings County Oil Works, on Newtown Creek, exploded. Fifteen hundred barrels of oil were destroyed, and the loss incurred was about $3,000. No one was injured this time. Take it all in all, Hunter's Point must be a rather likely place to keep away from.

BUFFALO (N. Y.) REFUSES GASOLINE STREET LAMPS.—At a recent meeting of the Committee on Lamps of the Buffalo City Council, it was decided to report adversely upon the resolution directing the City Comptroller to enter into a contract with the "Sun Vapor Light and Stove Company" to light Walden avenue, between Genesee street and Williamsville road, with vapor light. The Council subsequently ratified the action taken by the Committee. Buffalo's Councilmen could hardly do anything else, unless they wanted to make their streets look like those of a bankrupted New Jersey village.

BLOWING UP A BANK VAULT.—The vault of the Chemung Canal Bank, at Elmira, N. Y., was blown up (but not by burglars) on the morning of October 20th. On the Saturday previous (the 18th) one of the clerks shut the door of the main vault at the close of business on the usual hour, and, as supposed, either forgot to turn out the gas, or only partially shut off the current. At any rate, when Congressman Arnot, one of the bank's officers, opened the vault on the morning above noted he carried with him a lighted candle, with the result that a violent explosion immediately ensued. Mr. Arnot was hurled with great violence across the room and thrown against a counter. He also received a rather severe singeing. Every window in the bank building was blown out, the office door was shattered, and the place sadly demoralized. Mr. Arnot's injuries, while painful, are not of a serious nature; and it may be safely asserted that the Chemung Bank people will hereafter be careful to ascertain in advance, before "striking a light" in the vault, as to whether or not the gas was perfectly shut off in the treasure department.

PUBLIC LIGHTING AT CLEETHORPES, ENGLAND.—The *Electrical Review*, which publication is usually rather positive as to the advantages of electricity as a means of illumination, contains the following admission: "We understand that the Cleethorpes Gas Company has placed two patent Sugg and Bray gas lamps in position at Cleethorpes; one of 230 and the other of 200 candle power, to demonstrate the efficiency of gas lighting in competition with the electric light. Cleethorpes is at present illuminated by means of the latter light, in conjunction with oil lamps, but the result is stated to be far from satisfactory. The gas lamps spoken of have been burning for some time, and, it is said, have proved quite capable of holding their own against the electric light; their illumination, moreover, being of a much steadier description than that given by the arc lamps." If the managers of gas companies in our western towns where the specious promises made by electric lighting promoters have enabled them to gain a temporary hold upon the imaginations of verdant (or profligate) councilmen, would only follow out the course pursued by their brethren in Cleethorpes, the stay of the invaders would be cut rather short. Still, it is hardly necessary for us to cross the Atlantic in search of knowledge as to the course to be pursued. What better example can be given than the one instanced by Professor S. H. Douglas, at the late meeting of the Ohio Gas Light Association. When the electric folks came to Ann Arbor, the Professor "didn't scare worth a cent;" he quietly told the storekeepers of the city who were anxious for more light that he could give them all they wanted, and, with the aid of Brother Stein's burners, the Professor made good his word. Every member of the fraternity similarly situated could gain the victory just as easily as was done at Ann Arbor. The scheme is certainly worthy of a trial.

INSECTS ALTER THE COLOR OF A LIGHT.—During the entire night of date of August 23d last, the lantern of the lighthouse at Cape San Antonio, on the most extreme western point of the Island of Cuba, was surrounded by a cloud of winged insects almost entirely of a bright red hue. Their presence caused the light rays emitted by the lantern lamp to assume an intensely bright red color. The wind was moderate, blowing from the southwest, and the sky was overcast. Francisco Baritisti, the keeper of the light, mailed several specimens of the insect to a gentleman of New York city, who at once identified them as belonging to the species commonly known as cotton stainers.

A MODEST ESTIMATE.—Alderman Lehman, it appears, has been constituted by his brother members of the New Orleans (La.) Council as a select committee of one to examine and report upon whatever matters in the way of electric lighting may come before them. The latest proposal of the "select committee," as explained by Alderman L., is to grant the Brush Electric

Light Company permission to erect a tower, about 150 feet in height, at the corner of Baronne and Delord streets. The tower is to be "crowned with a diadem" of six lights—each of the nominal power of "about" 12,000 candles Alderman L. says that this arrangement will enable the city to extinguish "about" fifty gas lamps, and that the cost of the tower structure will be "about" $1,300—but the city is not to be asked for any portion of the expense so incurred; still, the alderman winds up by very innocently suggesting that should the experiment prove satisfactory, the municipality will be urged to adopt the towers for suburban lighting. The hint of the "special committee's" report comes in at the tail end. The New Orleans 12,000-candle power arc lamps are put up high enough in the air, and are undoubtedly elevated at an altitude perfectly safe to preclude any photometrical measurement save that of Alderman Lehman's acute-angled official eye.

Notwithstanding the exertions of the "special committee" detailed above, it appears that some others of the Board want gas lamps put up in certain places, and when the New Orleans Gas Light Company does not immediately respond to the demand, an immense amount of indignation is indulged in. Why this ruffling of the official bosom should occur is certainly a trifle ridiculous, keeping in view the fact that the municipal authorities have treated the New Orleans Gas Light Company generally, and in the matter of street lighting particularly, in a thoroughly mean and shabby manner. To illustrate the way Sec. Vallois, of the New Orleans Gas Light Company, feels on this subject, we herewith reproduce a letter sent to the Commissioner of Police (who, by-the-way, rejoices in the elegant name of Mealey), in response to a note demanding the reason why an order of Common Council to erect a lamp-post at a designated spot was not at once carried out. Sec. Vallois wrote: "Yours of even date has been received, and at the request of City Council the street lamp for St. Andrew street, between Baronne and Dryades streets, will be erected as soon as other work previously on hand shall have been attended to—say three or four days. In regard to the instructions received through your office from the City Council for the erection and maintenance of new gas lamps and posts, we desire to say that we do not understand under what authority the city assumes the right to order new lamps to be erected in any part of its limits. Our contract for street lamplighting grants the city privilege of discontinuing gas lamps wherever the electric lamps are extended; but no mention is made of its right to order the erection of new posts and lanterns; and the small sum of $16.66 annually paid for each of the street gas lamps does not warrant an outlay of $35 to $40 for each lamp, particularly at a time when we found ourselves deprived, by the extension of the electric lighting system, of all income on a large capital invested for the benefit of the city alone, and from which no profit can be derived by us if not applied to the original purpose of the investment." There are one or two points contained in Mr. V.'s letter which we would recommend as worthy of investigation by that "special committee of one."

They All Like Them.—Since the Siemens gas lamps were first introduced into the Barry Opera House, at Corning, N. Y., when that building was used as a rink for the accommodation and diversion of those fond of roller skating, the system of illumination has greatly grown in favor with the proprietors of similar buildings. The Harvard rink has been recently added to the list of public halls employing the Siemens burners, and the managers of the institution are delighted with the illuminating effects gained by the new departure. One of the officers of the Fall Brook Coal Company, while on a visit to the Harvard rink a few nights ago, was so impressed with the efficiency of the lamps that he determined to invoke their assistance in lighting the Fall Brook depot. These lamps advertise themselves, and the gas men of the country ought to avail themselves of the fact.

Killed by the Electric Current.—A man named William McGowan was instantly killed in the engine rooms of the Thomson-Houston Electric Light Company, of New York city, on the afternoon of Wednesday, October 22d. The *Tribune* says: "He accidentally touched a wire charged with a current of electricity, and instantly fell dead."

Fuel Gas at Yonkers, N. Y.—The Yonkers Fuel, Light and Power Company, having acquired the property and rights of the Yonkers Fuel Gas Company, and also of the Westchester Gas Light Company, has taken formal possession, and will supply customers with gaseous fuel for domestic and manufacturing operations, as is being done at Lynn, Mass.

The "Edgerton" System.—A resolution requesting the Philadelphia (Pa.) Gas Trust to make an examination into the merits of the "Edgerton" process of manufacturing illuminating gas was presented at a recent meeting of the Philadelphia Common Council. It is reported the offerer of the resolution estimated that, should the Edgerton system be adopted, the Trust would save somewhere in the neighborhood of one million dollars annually over cost of the coal gas process now in use. That alderman ought to be made engineer to the Trust; such a genius for figuring should be given an ample field wherein to display his talents. The resolution was referred to the Finance Committee.

Suffocated by Gas.—A short time ago two aged men, residing in a rear room on the first floor of the premises No. 38 Cherry street, New York city, were found in bed in an unconscious state, suffering from the effects of having inhaled illuminating gas. Shortly after discovery of their condition the elder of the two, Daniel Flynn, gave up the ghost; and his companion, supposed to be named Coleman, when examined by the physicians in charge of the Chambers Street Hospital (to which institution the man was immediately removed), gave every evidence of a speedy collapse.

The Messrs. Elkins Make Their Appearance in New York City.—The Messrs. Elkins, of Philadelphia, Pa., have made for themselves a reputation second to none others in the matter of "casting anchors to windward" in the business of opposition gas works proceedings. At last their line of march, or the order of their sailing, has brought them to New York city, and the following is evidence thereof. On Monday, March 20th, a certificate of incorporation of the Harlem Illuminating Company was filed in the office of the Clerk of New York County. The capital stock is placed at one million of dollars, divided into ten thousand shares of the par value of $100 each, the life of corporation to cover a period of 49 years. The directors are Messrs. Martin Maloney, of Philadelphia, Pa., who is also named as President; Nicholas R. O'Connor, New York city, Secretary; Geo. W. Elkins, Philadelphia, Treasurer—the remainder of board being W. L. Elkins and C. H. Robinson, of Philadelphia, and Jacob Gray and Henry Wellington, of New York city. Willard R. Jones, of 117 Nassau street, is the attorney. The company is organized under act of 1848, and is to furnish gas in that section of the city lying between 79th street and Harlem River. The corporation reserves the right to use coal, naphtha, steam, water, or any and all materials suitable for the generation of illuminating gas. It also may engage in the supply of electricity. The Elkins combination may expect to accomplish great things, but if the parties going to make up its aggregate are "wise unto their generation," they had better let that certificate remain safely pigeonholed in the County Clerk's office.

The Petroleum Situation.

Stowell's *Reporter*, in describing the recent status of the petroleum trade, says that a review of the petroleum trade for the month of September is practically the history of the life of one well. As stated in the last issue, the most prominent feature of interest during the month named was the Phillips well on Thorn Creek. Starting off on Sept. 2 at a fair rate, while in the third sand, this remarkable well, upon being drilled into the fourth sand, rapidly increased its output to 90 barrels an hour, and has averaged about 90 barrels, or over 2,000 barrels per day, up to the date of the present writing, October 18. While we have had larger wells, yet for an example of long continued and heavy production the Phillips well bears off the palm.

The report for September regarding production is on this account largely the report of one well. As it is, we find indicated a very considerable decrease in daily average, but had it not been for the Phillips gusher, there would have been a clear decrease in the diurnal output of 5,000 barrels, a drop of greater dimensions than has occurred for many months. A reference to our comparative statement will show that in all items, with the exception of the aggregate daily production of new wells, the average daily production of the same, and shipments, there has been more or less of a decrease, and the first two exceptions would not have to be made were it not for the performance of the Phillips gusher. As we remarked last month, while not too ready to credit the Producers' Union with more than is properly their due, it is still plainly evident that there has been brought about a remarkable and favorable change in the field situation in which their efforts cannot be overlooked. During the latter part of September they made several attempts to bring into line the Baldridge producers, but were, we understand, unsuccessful. However, it would appear that in this instance failure is more desirable than success. While it may be perfectly proper to restrict production by the shutting down of wells in known districts to force a suspension of work in a district such as the Thorn Creek field, and in its present condition of semi-development, would be to infuse into the situation a large element of distrust which might be more harmful to the market than would the amount of oil which would otherwise be produced. Let us know all we can about the extent and productiveness of this new field, and no uncertainty will then be felt when a shut-down is brought about.

Towards the close of September a little game, the character of which may be intimated to not very old oil operators by the cabalistic figures, "646," was tried once more by the owners of the Johnson well, not far from the famous Phillips. The Johnson well was drilled, stopped, drilled, boarded up, guarded, and finally thrown open to the public as a dry hole, all in the most approved "mystery" style, but all to little effect. Some little uncertainty

was contributed to the situation by this course, but prices were affected very slightly. The well was reported dry about the beginning of this month.

The relief of the trade upon the removal of this disturbing element was, however, destined to be brief. No sooner had they congratulated themselves over the fact that the Johnson well was not to be feared, than their calculations were again turned upside down by the advent of the greatest of gushers—the Christie well. The well had attracted some attention while drilling, as it was not far from the Phillips well. The scene that ensued when it began its enormous production on Saturday, Oct. 11, has been amply described in almost every daily newspaper in the country.

The well started in at the rate of about 1,500 barrels, which it raised to 2,500 on Monday. This was enough to knock the market down at a terrible rate, and the excitement on the exchanges was unprecedented. But the worst had not come. On Tuesday the well was gushing at the unheard of rate of 5,000 to 6,000 barrels per day, and the trade went wild. At the present writing it has declined somewhat, but is still entitled to rank among the largest gushers, doing about 3,500 barrels.

It is certainly difficult, in view of these recent developments, to arrive at a conclusion regarding the character or probable duration of the Baldridge pool. When we consider the long life of the Phillips well, with its large production, and then, after fifty days, the enormous amount of oil which the Christie well has succeeded in drawing from an almost identical source, it is indeed hard to form any opinion as to what we have in the future. The pool will, of course, eventually decline, but the circumstances referred to leave us no means of estimating how long this enormous output is to continue, and until we can see some signs of a decrease, there must be a measure of doubt in the situation. Other elements are confessedly favorable, but with the present phenomenal developments it is well to be cautious in endeavoring to say what may be.

Curious Properties of Coal Gas.

Mr. Thomas Fletcher, F.C.S., of Warrington, England, in the course of some remarks made by him at the opening to visitors of an exhibitton of all sorts of gas appliances, recently held at Chester, England, said it was surprising, when one considered how long gas had been in use, how little was known concerning it. Until within the last few years most people had been under the impression that it was merely a means of obtaining light, and even for this purpose it had been, and he might say still was, most wastefully used. The majority of people seemed to think that if they only burned a quantity of gas, it mattered very little how the gas was burned or what burners were used. As an example, he often saw ordinary sitting-rooms, about the size of his own—*i. e.*, 15 ft. by 20 ft.—lighted by three or four burners, each being most carefully enclosed with opal or ground glass globes, which wasted about half the light. His own sitting-room was lighted by one No. 8 Bray burner, and he might safely say that few rooms were so well lighted. People were not generally aware that one large burner, burning 8 feet per hour, gave far more light than two separate burners each consuming 4 feet per hour, and that one burner without shade was about as good as two with opal or ground glass globes. There were burners made of two small ones joined at a certain angle, which were said by the makers to give a great increase of light for the same gas consumption. The fact was that two burners, each burning 4 feet per hour, gave far more light when both flames were joined in one, but they gave little if any more light than a single good burner burning 8 feet per hour, and the compound burners were extremely liable to cause black smoke when turned low. There was another point not generally known—that, if a burner was placed at such an angle as to give a flat or saucer-shaped flame, the light was greatly increased; but this had a similar objection to the compound burner—it was liable to smoke when turned low. A great argument against the use of gas was the smoking of ceilings, and, curiously enough, those complaints came strongest from those people who burned their gas carelessly under excessive pressures without control, and under such circumstances that smoke was almost impossible. The liability to true smoke occurred only in such places as open shops, where the flames were blown about very much, or in those places where first-rate burners were used under the best conditions—that is, just verging on the smoking point. The fact was that the supposed smoke was not smoke at all; the discoloration was gray or brown, not black, as it would be with smoke, and was, he thought, caused only by the dust in the air being more or less burnt, caught in the ascending current of hot air, and thrown against the ceiling. When a servant lighted the gas on a dark morning, and proceeded to clean up the fireplace and dust the room, she did practically all the smoking of the ceiling which took place; once the dust settled, little discoloration occurred after. Gas could be burned most efficiently for heating purposes without any flame or visible combustion; in fact, flame was only a sign of incomplete or imperfect combustion; and, looking forward to a possibly near future, he believed that all fuels, both solid and gaseous, would be burnt for heating purposes without any flame. The use and value of gas for domestic purposes were, he said, well known to thousands. As a practical example he would take his own house with fourteen rooms, and an average of ten persons. Last year he paid for the twelve months £21 for gas, at 3s. 5d. per thousand cubic feet. He paid in eighteen months 27s. for coal for the kitchen fire, and had recently paid a similar amount, which he expected would clear him for coal for another eighteen months. Of the £21 expended, £8 went for lighting only, and about £3 10s. for cooking. He could not tell the cost of bath heating, but so far as he could judge it would be about 20s. per annum; the remaining £8 10s. was expended on gas fires, which they had used exclusively in the sitting-rooms and bedrooms for nearly two years. He might fairly say that the cooking and heating by gas saves them fully one servant, and thus paid indirectly more than the total gas bill. As to quality of cooking and convenience, there could be no possible comparison between gas and any known fuel. The gas fires were, or rather had been, new, and they had been careful and economical with all except one, which had been used as a test. In an average cold winter a room 15 by 20 feet and 11 feet high could be comfortably and pleasantly warmed by pure radiant heat with an average consumption of about 25,000 cubic feet of gas per annum. That at 3s. per thousand cubic feet would cost £3 15s. If they excluded the saving of labor and dirt, it was very decidedly more costly than coal; but, on the other hand, they must consider the great convenience and the perfect and instant control over the heat, which enables them to make the rooms far more comfortable than was possible with a coal fire, which was almost invariably either too hot or too cold.

Belgium's Coal Industry.

According to a French exchange the consumption of coal in Belgium is set down at 13,641,428 tons. The statement is given as below for the year 1883:

Production	18,187,754 tons.
Importions	1,301,197 tons.
Stock, Jan. 1, 1883	630,547 tons.
Total	20,119,498 tons.
From which deduct:	
Exportations	5,816,195 tons.
Stock, Jan. 1, 1884	661,875 tons.
Total	6,478,070 tons.

The whole trade and traffic is a growing one, and increased figures are shown in the extraction, importation, exportation and the consumption. France receives the greatest amount of the tonnage exported. The Province of Hainault is the largest coal district, producing thirteen and a half million tons out of the total. It seems that the miners there each produced an average of 171 tons last year, and that they received therefor an average wage of $1.18 per ton. The coal was sold at an average of $2.05 per ton. It seems that the other expenses outside of mining averaged 80 cents per ton, thus making a return for the capitalist of but seven cents per ton. There were 2,838 coke ovens at work, which consumed 1,989,135 tons of raw coal, and gave a production of 1,465,691 tons of coke, or say a yield of 72 per cent. The coke sold at (17.18 francs) $3.40 per ton at the ovens, and it is said that this is a reduction from last year, the demand having fallen off in common with the condition of affairs in the same trade in other countries.

An Electric Shock from a Kitchen Sink.

The *Iron Age* reports the following very singular occurrence, which is stated to have recently taken place at Ithaca, in this State, and rather forcibly illustrates the dangers attendant upon the universal introduction of electricity. As a lady was turning on the water from the faucet over the sink in her kitchen, using her right hand, her left hand being in contact with the iron lining of the sink, she was suddenly prostrated by a severe shock. Her impression was that she had been stricken with paralysis or appoplexy, but a physician who was summoned found that the inside of the thumb of the left hand had been blistered in several places. This led him to believe that she had received a strong electric shock from some source. A few minutes subsequently the lady's daughter, in drawing water from the same faucet, was similarly affected, though not so severely. The family then became convinced that the trouble existed in the water-pipe and sink. The manager of the Telephone Exchange, after a brief examination of the premises, found the secret of the trouble. The residence was connected with the Ithaca Hotel by a "dead" private telegraph wire. This wire had been crossed with the electric light wire. The "dead" wire was connected with the metallic roof on the dwelling-house, which in turn was connected by a tin water conductor with the water-pipe leading to the sink. When the dynamo machine of the electric light company was in operation the current passed over the "dead" wire to the tin roof, and thence to the water-pipe. It needed only the completion of the circuit by some person drawing water to obtain the full benefit of an artificial stroke of lightning.

THE AMERICAN GAS LIGHT JOURNAL

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PROPRIETORS.

Editor—JOS. R. THOMAS, C.E.
Manager—C. E. SANDERSON.

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MONDAY, NOVEMBER 3, 1884.

DEATH OF A GAS ENGINEER.—Mr. Ignatz Herzog, for many years in the service of the Metropolitan Gas Company, of this city, died on the 23d of last October.

American Versus Russian Sheet Iron.

Scientific Press claims that American planished sheet iron is now made fully equal if not superior to the best Russian iron. A Pittsburgh firm, W. D. Wood & Co., have labored assiduously for thirty years to perfect this description of iron. They have now attained such a degree of success in its manufacture that some workers in that metal pronounce it quite superior to the Russian make. It is said to be more evenly rolled, equally soft and ductile, more highly polished, or "glanced," as it is technically called; equally as durable to weather, exposure, etc. It is also made of different widths, which gives it the advantage of being worked up more economically, while Russia iron is always made of a given length and width, and probably always will be.

It is no longer necessary to go to Russia for this indispensable material. We can now obtain it from our own shops, and it is said that since the more recent improvements in its manufacture have become generally known, the importation of the foreign article has fallen off fully one-half. Indeed it is stated that the consumption of American planished iron is now more than double that of the imported article. We have in this manufacture another evidence of the mechanical progress which our people are making.

Painting Tin Roofs.

The *Metal Worker* says that tin on a house top should be well painted once in four years. For roofs light, cool colors are preferable, because they reflect the warm rays of light, and thereby lessen the expansion and contraction of the metal and the shrinking of the boards underneath, and so lessen the liability of the tin to crack in the seams. The temperature of attic rooms in summer will be materially lowered if the roof be painted with a light rather than with a dark color. The writer has learned from long experience that the finest French ocher is the most economical pigment that can be used for that purpose. If, as is sometimes the case in country houses, where the roof is a conspicuous object in the architecture of the building, a dark color be indispensable, the use of pure Venetian red, darkened with lampblack, is recommended as the most durable and economical. If by some process the oil used in roof painting could be prevented from becoming hard and brittle, it would be a great gain. The poorest oil paint, however, is better than neglect; and the best economy consists in keeping tin entirely and thoroughly protected from the corroding influence of dampness. Old paint, which has become "fatty" from exposure to the atmosphere, is better than new for roof painting. Not a drop of turpentine should be used for such work.

The Market for Gas Securities.

The market for city gas shares has indulged in a vast amount of "tumbling" during the period embraced between the 16th and 30th days of October, and the gas stock brokers are all at sea regarding predictions for the future. The consolidation measures are awaiting the result of the stockholders' meetings, and the grumbling among certain holders in certain companies appears to be on the increase as the final hour approaches. The Mutual Company can now pretty safely be set down as one that will refuse to come into the combination; and this assertion is made from the fact that no meeting of its shareholders has yet been called. It seems, according to the rumor mongers, that a strict construction of its charter will prevent it from combining in the manner proposed; but why this discovery was not made at or before the time when the preliminary negotiations were in progress seems just a trifle odd, since it would seem, in the natural order of things, that its representative at the initiatory conferences ought to have been "posted" as to what legal course might be followed under the clauses of a charter now many years of age. The decline in Harlem stock may be partially accounted for by the springing into existence of the Harlem Illuminating Company, which proposes to operate an opposition plant in the district between 79th street and the Harlem river. The coterie at the head of the opposition movement are thoroughly well posted in all the latest tactics as applied to the art of gas warfare, but there are certain difficulties in their way which we think are quite liable to make them "look before they leap." In fine, we would advise Harlem gas shareholders to keep their securities, and not cry before being hurt. Without at present attempting to give any reason for the very marked depression now prevailing, we may hereafter have a few words to say on the subject. Auctioneer Muller has during the last fortnight sold quite a number of gas stocks and bonds, of which the following is a partial list: Oct. 22, twelve shares New York, at 179¼, ex-dividend of five per cent., payable November 1st. October 29th, 100 shares Manhattan, at 290; 100 at 285½; and 100 at 278; 50 shares Metropolitan, at 203; 20 at 211; and 130 shares at 210. 250 shares of Harlem, at 105½; 100 shares Equitable, at 93¼. Same day, $7,500 Metropolitan first mortgage bonds, at 111¼; and 200 shares of "Union Gas Company," New York city, at $4 for the lot.

In out-of-town shares Muller also sold, on Oct. 29th, 440 shares of Nassau, of Brooklyn, at 100. $25,000 Williamsburgh, Brooklyn, first mortgage bonds, at par; 60 shares Flushing (L. I.), gas, at 141; and 38 shares Cincinnati (Ohio), gas, at 177½. Brooklyn (N. Y.) shares are fairly steady. We note a sharp decline in Jersey City gas, the shrinkage amounting to about 20 "points." This decline is chargeable to the starting in of main laying by the opposition party. Baltimore Consolidated still keeps on with the upward movement, Baltimore brokers reporting a large demand for the security as coming from New York city, and it is also said that Baltimore holders are in no hurry to accept the figures offered. We have it on the best of authority that the Staten Island tangle is far from being unraveled, and that the opositionists are to commence the work of main laying this week. San Francisco shares are strong.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks (with A. E. SCOTT & Co.,)

72 BROADWAY, NEW YORK CITY.

NOV. 3.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share. ☜

	Capital.	Par.	Bid	Asked
Central	$466,000	50	75	90
Equitable	2,000,000	100	92	94
Harlem	2,000,000	50	105	115
" Bonds	170,000		—	—
Manhattan	4,000,000	50	280	290
Metropolitan	2,500,000	100	210	215
" Bonds	658,000	—	110	112
Mutual	3,500,000	100	124	126
" Bonds	1,500,000	1000	104	106
Municipal	3,000,000	100	200	215
" Bonds	750,000		107	110
New York	4,000,000	100	163	167x
Northern	125,000	50	—	80
" Scrip	108,000			
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	138	141
Citizens	1,200,000	20	91	93
" S. F. Bonds	320,000	1000	106	110
Fulton Municipal	3,000,000	100	152	155
" Bonds	300,000		104	108
Peoples	1,000,000	10	85	90
" Bonds	290,000	—	105	110
" "	250,000	—	90	95
Metropolitan	1,000,000	100	94	98
Nassau	1,000,000	25	100	—
" Ctfs	700,000	1000	85	90
Williamsburgh	1,000,000	50	138	141
" Bonds	1,000,000	—	104	108
Richmond Co., S. I.	300,000	50	64	75
" Bonds	40,000	—	—	—
Out of Town Gas Companies.				
Buffalo Mutual, N. Y.	750,000	100	80	85
" Bonds	200,000	1000	95	100
Citizens, Newark	918,000	50	103	115
" " Bonds	124,000	—	105	110
Chicago Gas Co., Ills			150	155
Cincinnati G. & C. Co.			178	182
Consolidated, Balt.			82¾	83
" Bonds			112	113
Central, S. F., Cal.			—	70
Capital, Sacramento, Cal.			55½	—
Hartford, Conn	750,000	25	128	132
Jersey City	750,000	20	120	125
Laclede, St. Louis, Mo.	1,600,000	100	100	—
Louisville, Ky	1,500,000	50	99	103
Montreal, Canada	2,000,000	100	165	175
New Haven, Conn		25	166	170
Oakland, Cal			29	30
Peoples, Jersey City		—	—	75
" " Bonds			—	—
Paterson, N. J		25	96	99
Rochester, N. Y		50	75	80
Washington, D. C	2,000,000	20	185	190
Wilmington, Del		50	188	—
Yonkers		50	—	4
St. Louis, Missouri	600,000	50	—	575
San Francisco Gas Co.				
San Francisco, Cal.			63	64

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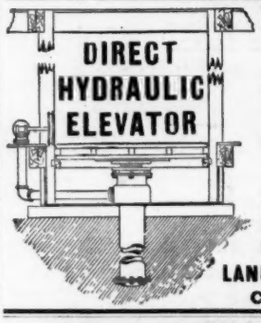

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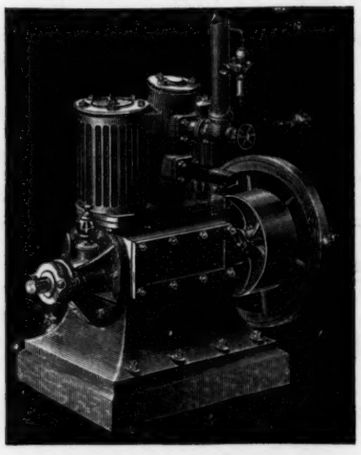

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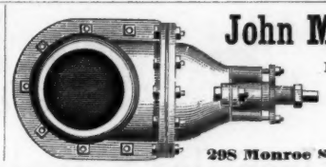

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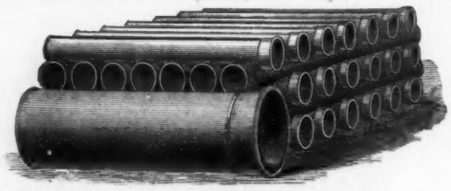

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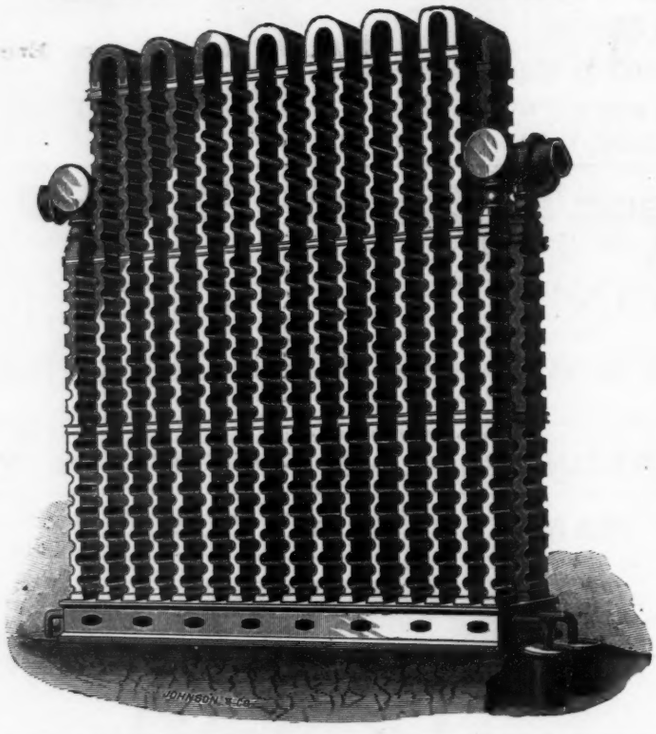

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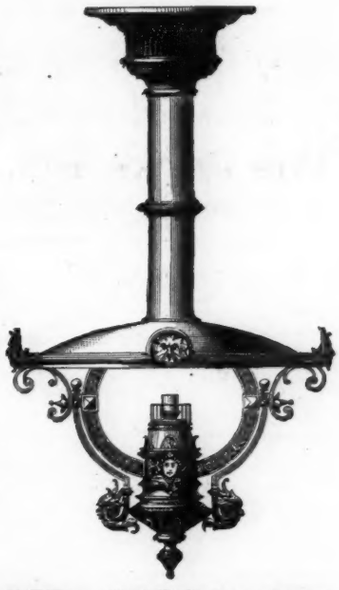

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1883	57,735,000 "
1884	26,177,500 "
Total	235,937,500 cubic feet.

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	Number.	Cubic Feet per Day.
Great Britain	151	157,070,000
Western Hemisphere	38	39,337,500
Australia	18	12,150,000
New Zealand	2	650,000
France	6	4,550,000
Belgium	8	5,420,000
Germany	16	8,200,000
Holland	4	4,160,000
Denmark	1	150,000
Russia	2	3,500,000
Spain	1	350,000
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Total	248	235,937,500

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Cokerei der Friedenshutte, Upper Silesia	200,000
Dumfries Corporation	250,000
Dunedin Gas Co., New Zealand	400,000
King's Lynn Gas Co	300,000
Leiden, Holland	600,000
Lincoln Gas Co	400,000
Liverpool Gas Co	2,000,000
" "	3,000,000
LOUISVILLE GAS CO.	1,500,000
Numea Gas Co	100,000
PITTSBURGH GAS CO	1,500,000
PORTLAND GAS CO., Oregon	562,500
SAN FRANCISCO GAS CO	2,000,000
" "	2,000,000
Sheepbridge	40,000
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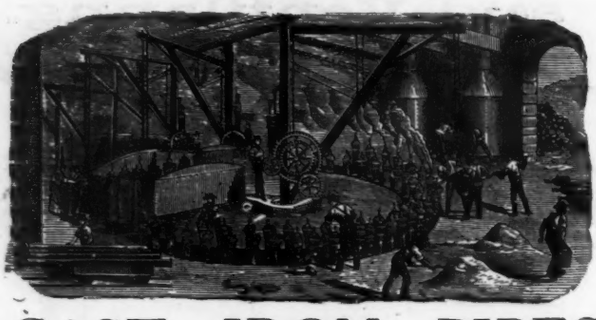

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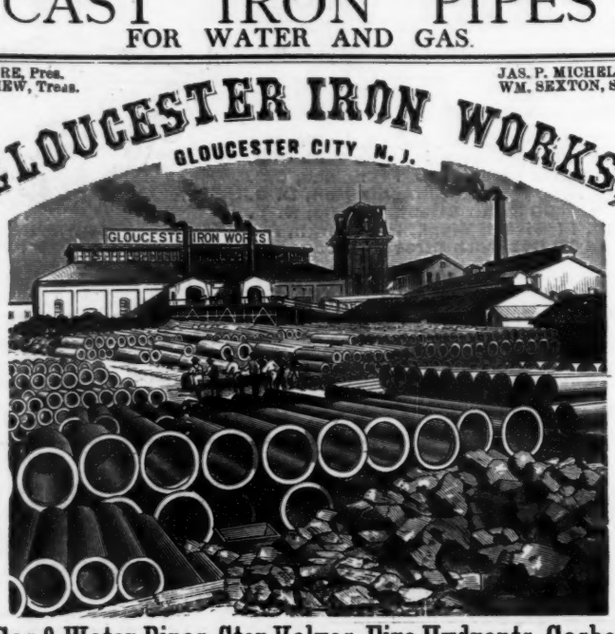

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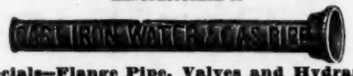

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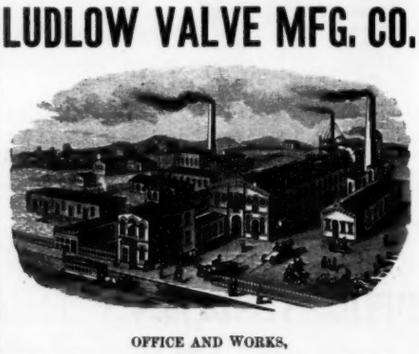

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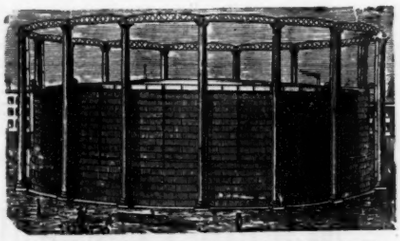

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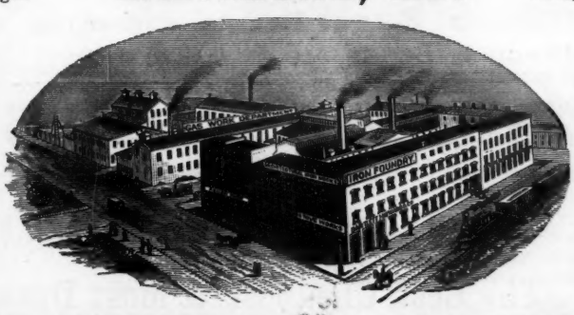

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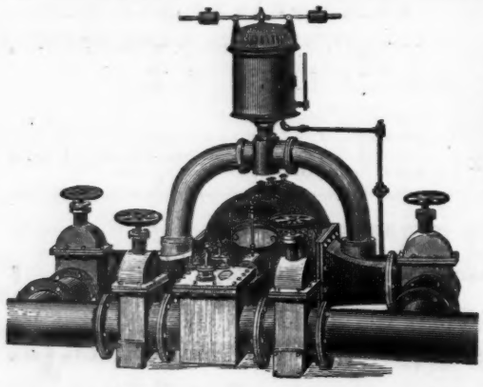

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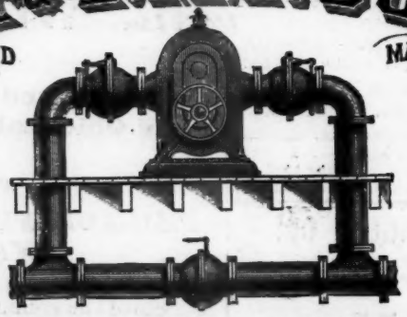

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